

PGSuper

TOGA

Texas Optional Girder Analysis

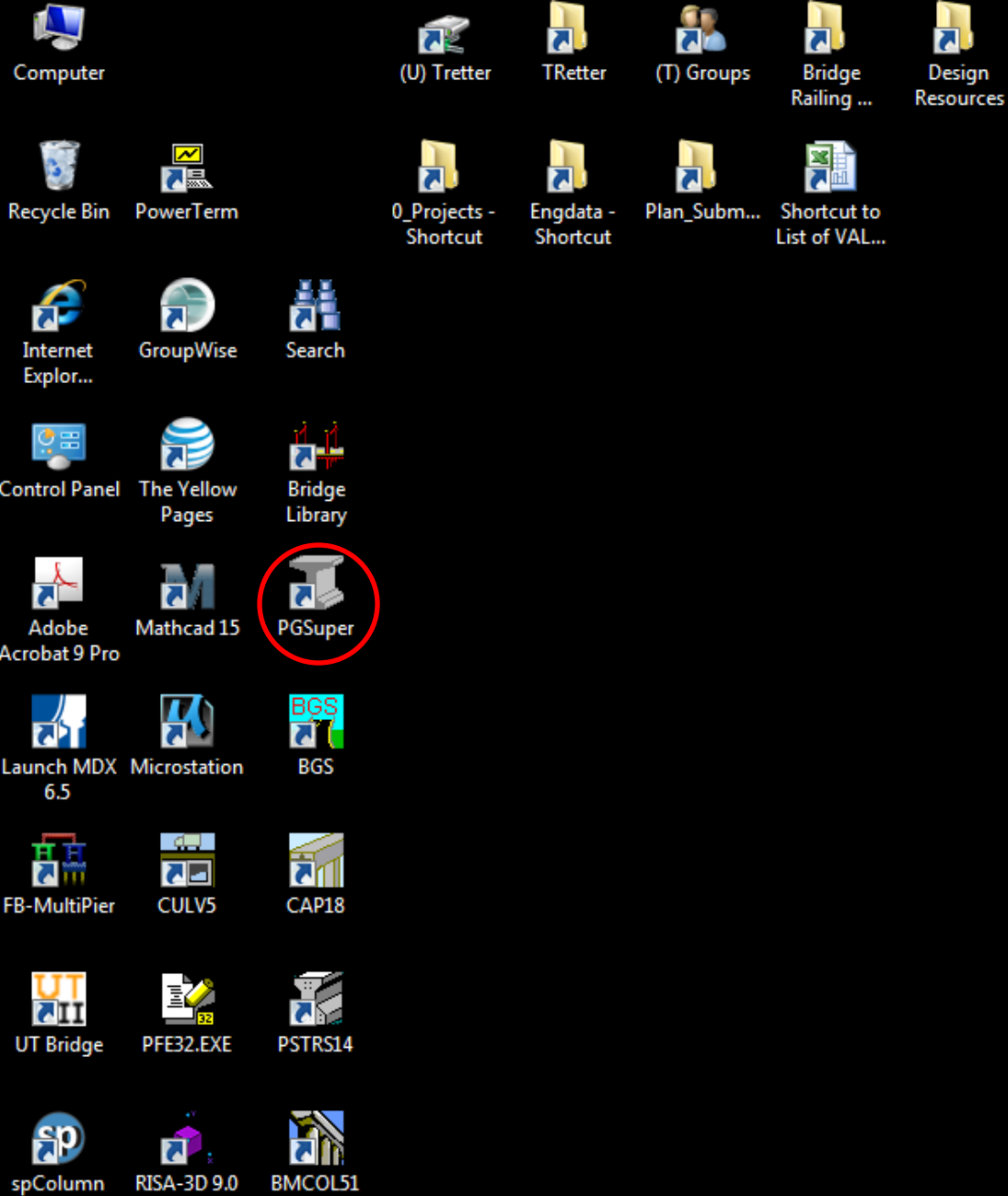
Taya Retterer

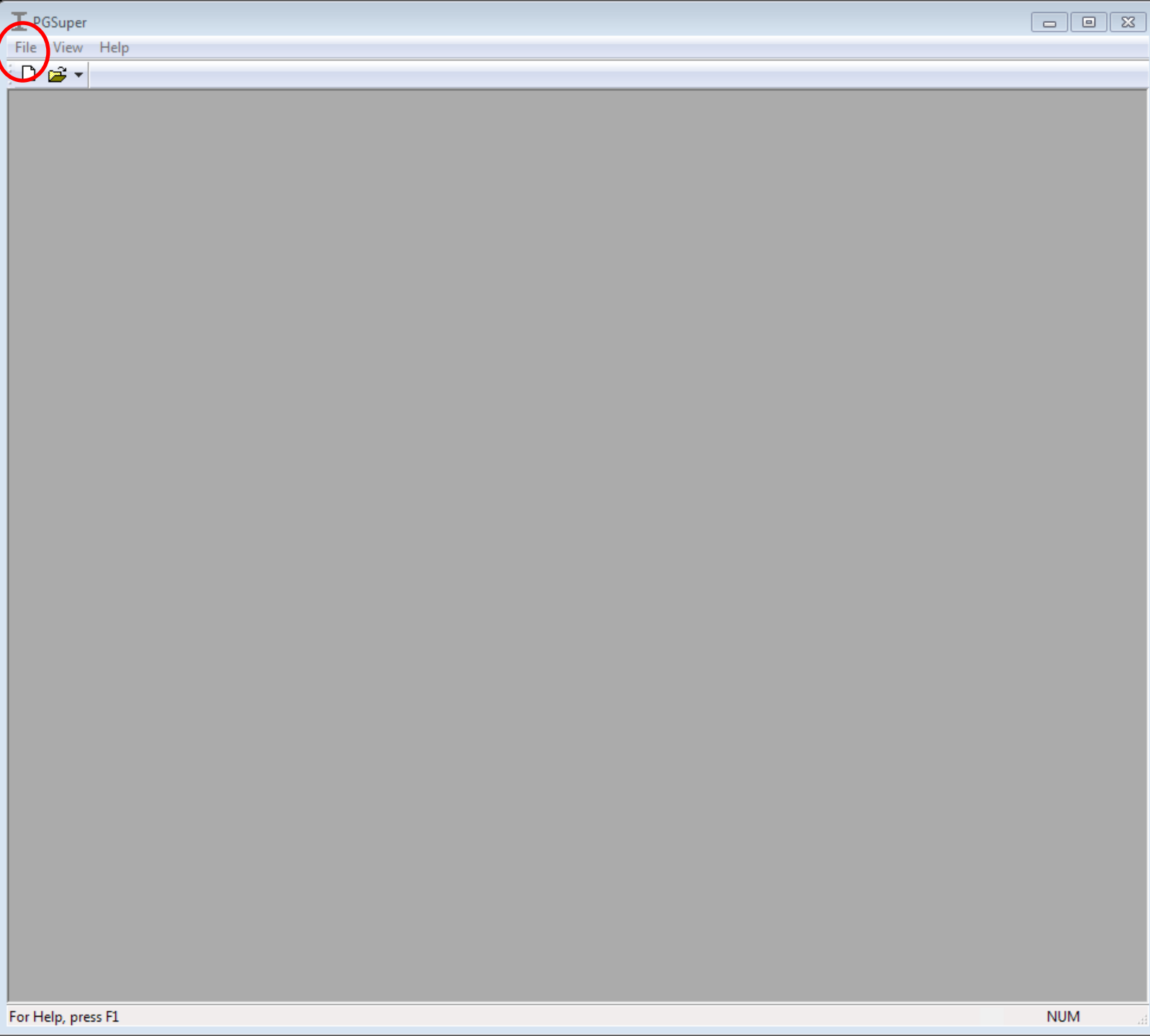
February 15, 2012

Introduction

- What is TOGA?
 - Texas Optional Girder Analysis
 - For Tx Girders and I Beams

Straight to an Example!





New

Ctrl+N

Open...

Ctrl+O

Manage

Configure PGSuper...

Print Setup...

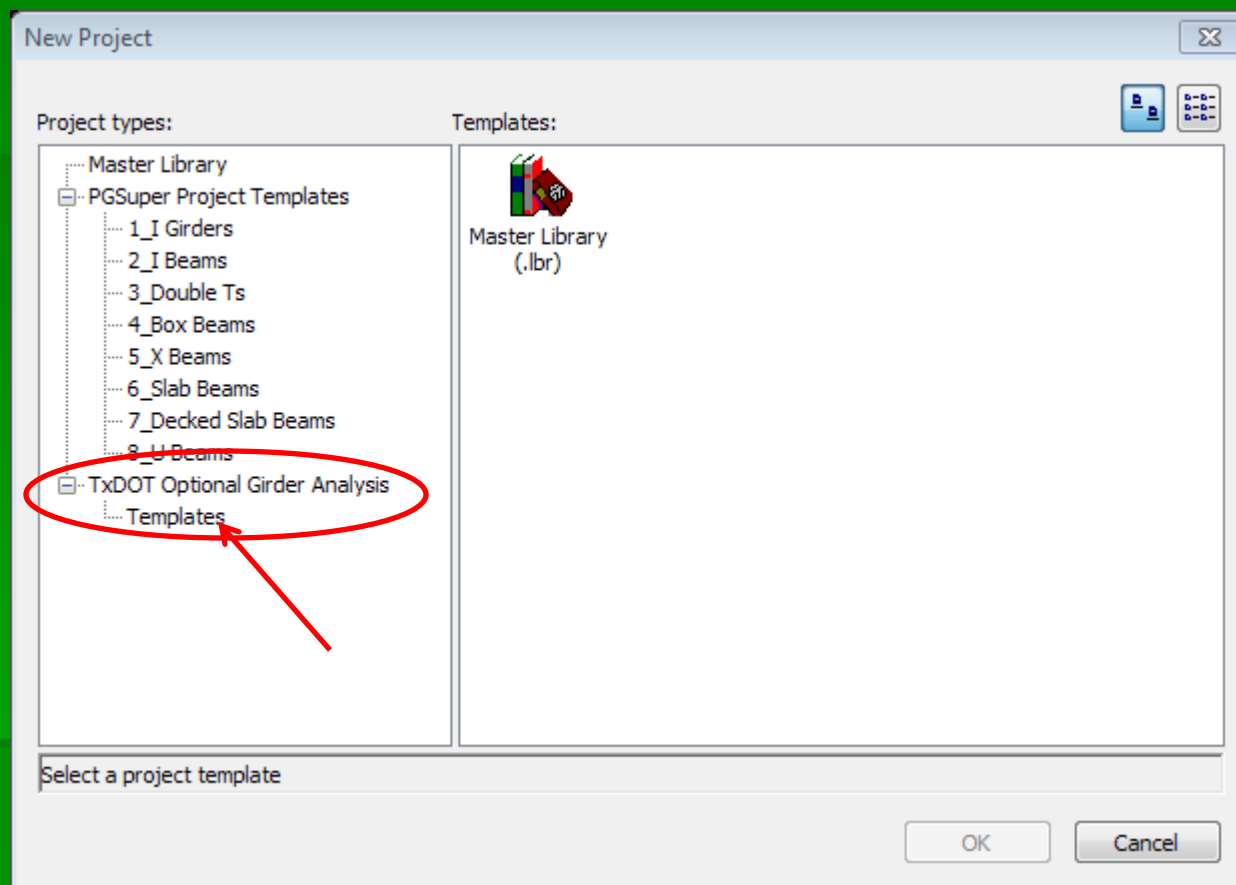
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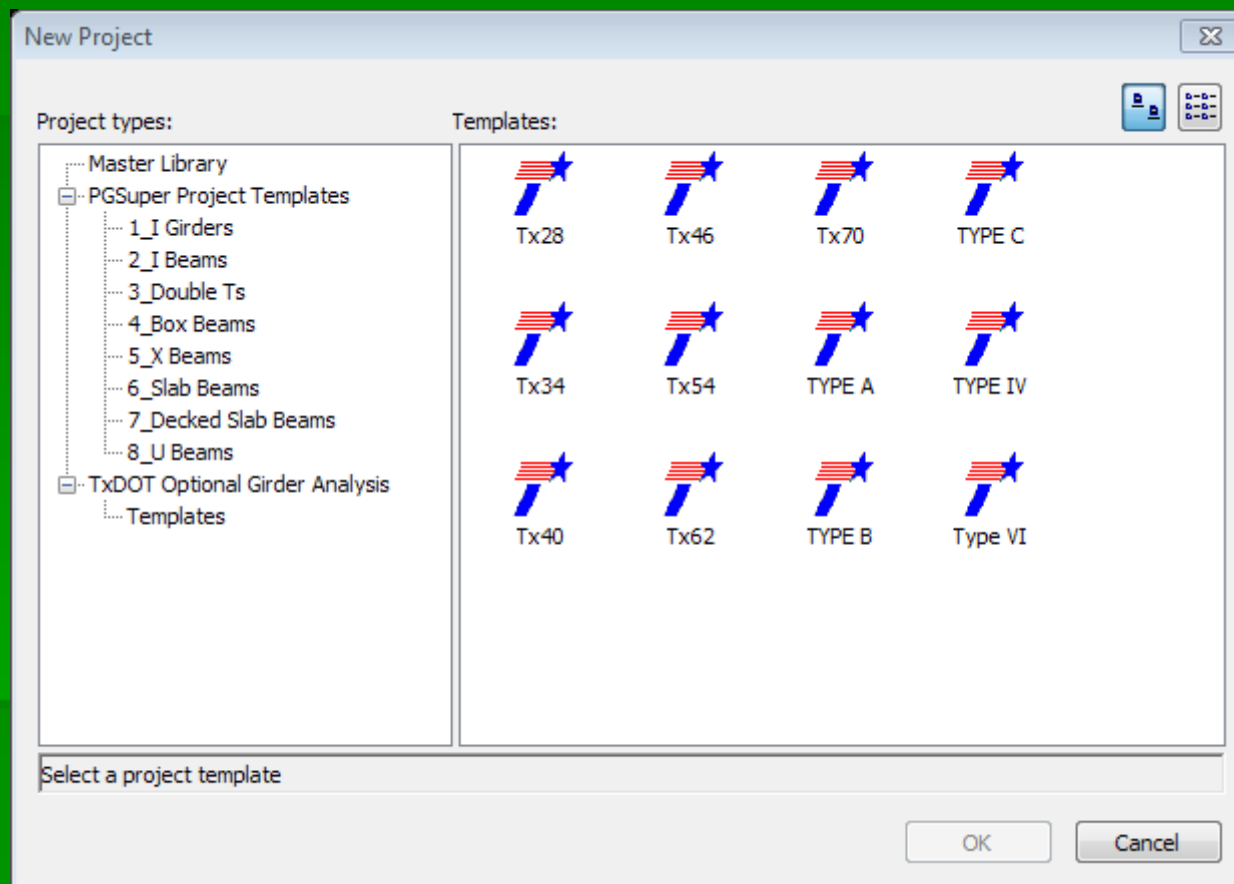
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Exit



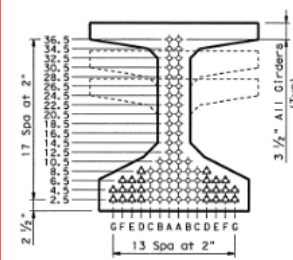


DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act" and the "Texas Professional Engineers Act". It is the responsibility of the user to ensure that the design meets the requirements of the applicable laws and regulations. The user assumes no responsibility for the consequences of the use of this standard for any purpose other than that for which it was intended.

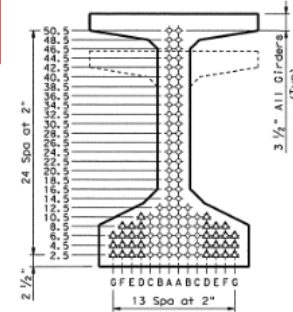
LEVEL DEPARTS

ACC

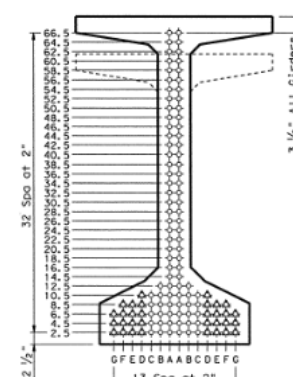
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	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE				DESIGN LOAD COMPRESSION STRESS (TOP & BOTTOM) (ksi)	DESIGN LOAD TENSILE STRESS (SERVICE I) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIP)	LIVE LOAD DISTRIBUTION FACTOR			
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"a" END (in)	DEPRESSED		RELEASE STRENGTH (ksi)	MINIMUM 28 DAY COMP. STRENGTH (ksi)				STRESS (SERVICE I) (ksi)	STRENGTH I (ksi)	MOMENT	SHEAR
										NO.	TO									
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634		
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634		
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767		
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767		
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767		
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767		
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767		
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634		
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634		
	3-8 & 16-18	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.945	7754	0.591	0.767		
	9&14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.384	-2.490	5122	0.633	0.767		
	13	ALL	Tx54		34	1/2	270	19.48	16.65	6	22.5	4.000	5.000	2.583	-2.682	5474	0.625	0.767		
	15	ALL	Tx54		68	1/2	270	16.83	9.42	14	50.5	5.800	6.400	4.068	-4.211	8594	0.718	0.767		
	19	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.059	7956	0.588	0.767		



TYPE Tx28, Tx34 & Tx40



TYPE Tx46 & Tx54



TYPE Tx62 & Tx70

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT E OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5) B(2.5, 4.5, 6.5, 8.5, 10.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications. All concrete must be Class H. Provide Class HRPC if shown elsewhere in plans. All reinforcing bars must be Grade 60. When shown on this sheet, the fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer. Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder. Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform. For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table. Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of f_{pu} each. Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'_{ci}

Tension = 0.24 $\sqrt{f'_{ci}}$

Optional designs must likewise conform.

(2) Portion of full HL93.

(3) Full-length debonded strands are only permitted in strand positions marked Δ . Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.

HL93 LOADING

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

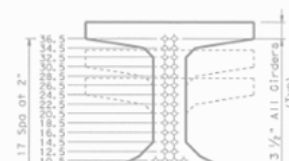
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DATE: June 2007	REVISED	FEDERAL AID PROJECT	446	
REVISION:	ELP			
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10/01: General Notes	EL PASO	2552	03	034 LP 379
12/01: Bel Smith & LIOF.				

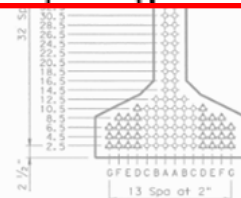
NICHOLAS NEMEC
102288
LICENSED
Nicholas Nemes
3/24/2011

Revised 03-23-11

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN						<div><div>17' 500 02" 2"</div><div>17' 500 02" 2"</div></div> <div><div>36"</div><div>34"</div><div>32"</div><div>30"</div><div>28"</div><div>26"</div><div>24"</div><div>22"</div><div>20"</div><div>18"</div><div>16"</div><div>14"</div><div>12"</div><div>10"</div><div>8"</div><div>6"</div><div>4"</div><div>2"</div><div>0"</div></div> <div><div>13 1/2" A-11 Girders</div><div>(Type)</div></div> <th colspan="2">NON-STANDARD STRAND PATTERNS</th>	NON-STANDARD STRAND PATTERNS						
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) (ksi)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE II) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIP)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT E OF GIRDER									
					TOTAL NO.	SIZE	STRENGTH	"a" ϵ	"e" END	DEPRESSED NO.	TO							RELEASE STRENGTH (ksi)		MINIMUM 28 DAY COMP STRENGTH (ksi)						
																					f _{pu} (ksi)	f _{cu} (ksi)	f _{cu} (ksi)	f _{cu} (ksi)	f _{cu} (ksi)	f _{cu} (ksi)
1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	(4)	A(2, 5, 4, 5, 6, 5, 10, 5, 12, 5) B(2, 5, 4, 5, 6, 5, 10, 5, 12, 5) C(2, 5, 4, 5, 6, 5, 10, 5) D(2, 5, 4, 5, 6, 5, 10, 5) E(2, 5, 4, 5)							
2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	(5)	A(2, 5, 4, 5, 6, 5, 10, 5)							



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE II) f _{cb} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) M _u	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f' _{ci} (ksi)				MINIMUM 28 DAY COMP STRENGTH f' _c (ksi)	LIVE LOAD DISTRIBUTION FACTOR (2)	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
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	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767



Nicholas Ramec
3/24/2011

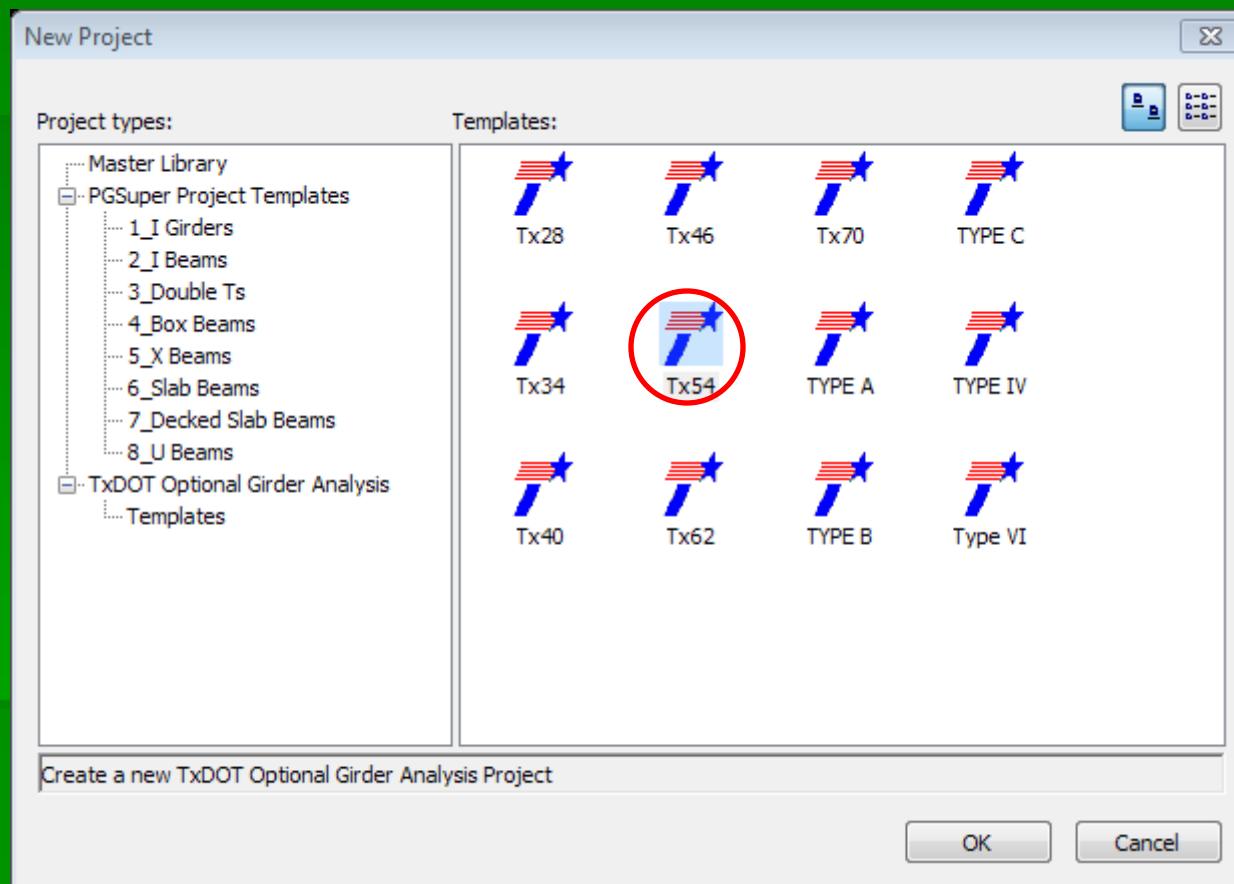
Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

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TYPE Tx62 & Tx70

Revised 03-23-11





General Information

Bridge

Engineer T Retterer

Bridge ID

Company TxDOT

Job Number Comments

Design Information

Span No. Span Length
(CL Bearings) ftRelative Humidity %Beam No.

Beam Spacing

 ft

LLDF (Moment)

Beam Type

Tx54

Slab Thickness

 in

LLDF (Shear)

Material Properties

Ec, Slab 5000.000 KSI

Ec, Beam 5000.000 KSI

f'c, Slab 4.000 KSI

Design Data

*ft, Design Compressive Stress, Top CL KSI*fb, Design Tensile Stress, Bottom CL KSIMu, Required Ultimate Moment Capacity kip-ft

* Note: Tension is negative

Optional Uniform Design Loads

W non-comp, DC 0.000 kip/ft

W comp, DC 0.000 kip/ft

W Overlay 0.000 kip/ft

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On

TxDOT 2010

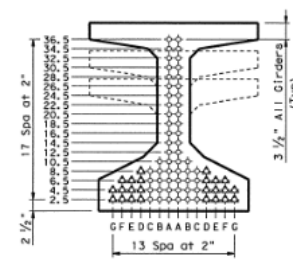
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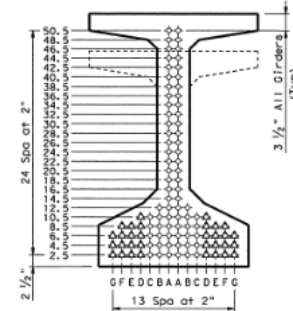
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LEVELS REPAIRED

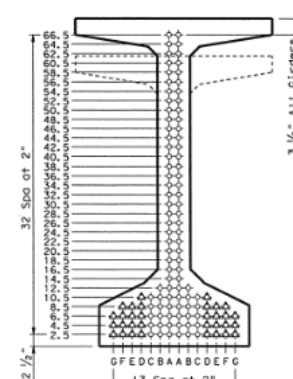
STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN						
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE				DESIGN LOAD COMPRESSION STRESS TOP OF GIRDER (ksi)	DESIGN LOAD TENSION STRESS BOTTOM OF GIRDER (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-k/ps)	LIVE LOAD DISTRIBUTION FACTOR (2)	MOMENT	SHEAR
					TOTAL NO.	SIZE	STRENGTH (ksi)	"a" (in)	"e" END (in)	DEPRESSED NO.	TO	RELEASE STRENGTH (ksi)	MINIMUM 28 DAY COMP STRENGTH (ksi)						
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.63	
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.63	
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.76	
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.76	
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.76	
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.76	
21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.76		
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.63	
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.63	
	3-8 & 16-18	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.945	7754	0.591	0.76	
	9&14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.384	-2.490	5122	0.633	0.76	
	13	ALL	Tx54		34	1/2	270	19.48	16.65	6	22.5	4.000	5.000	2.583	-2.682	5474	0.625	0.76	
	15	ALL	Tx54		68	1/2	270	16.83	9.42	14	50.5	5.800	6.400	4.068	-4.211	8594	0.718	0.76	
19	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.059	7956	0.588	0.76		



TYPE Tx28, Tx34 & Tx40



TYPE Tx46 & Tx54



TYPE Tx62 & Tx70

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT % OF GIRDER
④	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)
⑤	A(2.5, 4.5, 6.5, 8.5, 10.5) B(2.5, 4.5, 6.5, 8.5, 10.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications. All concrete must be Class H. Provide Class HRPC if shown elsewhere in plans. All reinforcing bars must be Grade 60. When shown on this sheet, the fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer. Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder. Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform. For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table. Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of f_{pu} each. Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

① Based on the following allowable stresses (ksi):

Compression = 0.65 f'_{ci}

Tension = 0.24 $\sqrt{f'_{ci}}$

Optional designs must likewise conform.

② Portion of full HL93.

③ Full-length debonded strands are only permitted in strand positions marked Δ. Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.



Nicholas Nemes
3/24/2011

HL93 LOADING

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: ignd1.dgn	Rev: JNH	Rev: TxDOT	Rev: JTR	Rev: TxDOT
④ TxDOT June 2007	REVISED	FEDERAL AID PROJECT		
REVISION	ELP			446
02/09: General Notes	COUNTY	CONTROL	DECT	JOB
12/15: Bel Smith & LIOF.	EL PASO	2552	03	034 LP 379

Revised 03-23-11



General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





General Information

Bridge NB Direct Connector

Engineer T Retterer

Bridge ID

Company TxDOT

Job Number

Comments

Design Information

Span No.

Span Length
(CL Bearings)

ft

Relative Humidity

%

Beam No.

Beam Spacing

ft

LLDF (Moment)

Beam Type

Tx54

Slab Thickness

in

LLDF (Shear)

Material Properties

Ec, Slab 5000.000 KSI

Ec, Beam 5000.000 KSI

f'c, Slab 4.000 KSI

Design Data

*ft, Design Compressive Stress, Top CL

KSI

*fb, Design Tensile Stress, Bottom CL

KSI

Mu, Required Ultimate Moment Capacity

kip-ft

* Note: Tension is negative

Optional Uniform Design Loads

W non-comp, DC 0.000 kip/ft

W comp, DC 0.000 kip/ft

W Overlay 0.000 kip/ft

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On

TxDOT 2010

(Allowable compression stress factor at release = 0.65)



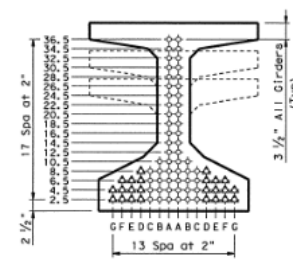
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act" and the "Texas Professional Engineers Act". TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or omissions resulting from its use.

LEVELS REPEATED

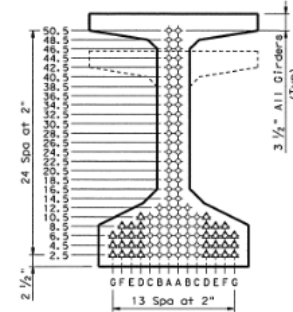


Washington State
Department of Transportation

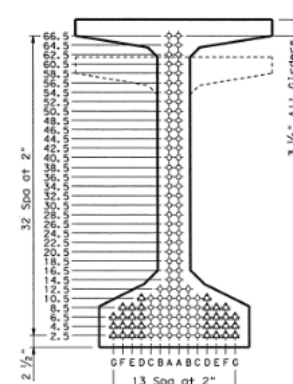
STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE				DESIGN LOAD TOP OF GIRDER (KSI)	DESIGN LOAD TENSILE STRESS (KSI)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIP)	LIVE LOAD DISTRIBUTION FACTOR	
					TOTAL NO.	SIZE	STRENGTH (KSI)	"a" E (IN)	"b" END (IN)	DEPRESSED		RELEASE STRENGTH (KSI)	MINIMUM 28 DAY COMP STRENGTH (KSI)					
										NO.	TO							1
					(IN)	(IN)	(KSI)	(IN)	(IN)	(IN)	(KSI)	(KSI)	(KSI)	(KSI)	(KSI)	(KSI)	(KSI)	(KSI)
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.63
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.63
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.76
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.76
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.76
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.76
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.76
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.63
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.63
	3-8 & 16-18	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.945	7754	0.591	0.76
	9&14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.384	-2.490	5122	0.633	0.76
	13	ALL	Tx54		34	1/2	270	19.48	16.65	6	22.5	4.000	5.000	2.583	-2.682	5474	0.625	0.76
	15	ALL	Tx54		68	1/2	270	16.83	9.42	14	50.5	5.800	6.400	4.068	-4.211	8594	0.718	0.76
	19	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.059	7956	0.588	0.76



TYPE Tx28, Tx34 & Tx40



TYPE Tx46 & Tx54



TYPE Tx62 & Tx70

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT % OF GIRDER
(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)
(5)	A(2.5, 4.5, 6.5, 8.5, 10.5) B(2.5, 4.5, 6.5, 8.5, 10.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications. All concrete must be Class H. Provide Class HRPC if shown elsewhere in plans. All reinforcing bars must be Grade 60. When shown on this sheet, the fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer. Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder. Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform. For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table. Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of f_{pu} each. Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'_{ci}

Tension = 0.24 $\sqrt{f'_{ci}}$

Optional designs must likewise conform.

(2) Portion of full HL93.

(3) Full-length debonded strands are only permitted in strand positions marked Δ . Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.



Nicholas Nemes
3/24/2011

HL93 LOADING

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

FILE: ignd101.dgn	REV: JNH	REV: TxDOT	REV: JTR	REV: TxDOT
DATE: June 2007	DATE: June 2007	DATE: June 2007	DATE: June 2007	DATE: June 2007
REVISION:	ELP	FEDERAL AID PROJECT		
DESIGN: General Notes	COUNTY	CONTROL	SECTION	JOB
10/01: General Notes	EL PASO	2552	03	034 LP
12/01: Bill Smith & LIOF.				

Revised 03-23-11



PGSuper





Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge NB Direct Connector

Bridge ID

Job Number 2552-03-034

Engineer T Retterer

Company TxDOT

Comments

Design Information

Span No. Span Length (CL Bearings) ft Relative Humidity %

Beam No. Beam Spacing ft LLDF (Moment)

Beam Type Tx54 Slab Thickness in LLDF (Shear)

Material Properties

Ec, Slab 5000.000 KSI Ec, Beam 5000.000 KSI f'c, Slab 4.000 KSI

Design Data

*fc, Design Compressive Stress, Top CL KSI *fb, Design Tensile Stress, Bottom CL KSI

Mu, Required Ultimate Moment Capacity kip-ft * Note: Tension is negative

Optional Uniform Design Loads

W non-comp, DC 0.000 kip/ft W comp, DC 0.000 kip/ft W Overlay 0.000 kip/ft

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On TxDOT 2010

(Allowable compression stress factor at release = 0.65)





General Information

Bridge	NB Direct Connector	Engineer	T Retterer
Bridge ID		Company	TxDOT
Job Number	2552-03-034	Comments	

Design Information

Span No.		Span Length (CL Bearings)		ft	Relative Humidity		%
Beam No.		Beam Spacing		ft	LLDF (Moment)		
Beam Type	Tx54	Slab Thickness		in	LLDF (Shear)		

Material Properties

Ec, Slab	5000.000	KSI	Ec, Beam	5000.000	KSI	f'c, Slab	4.000	KSI
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Design Data

*ft, Design Compressive Stress, Top CL		KSI	*fb, Design Tensile Stress, Bottom CL		KSI
Mu, Required Ultimate Moment Capacity		kip-ft	* Note: Tension is negative		

Optional Uniform Design Loads

W non-comp, DC	0.000	kip/ft	W comp, DC	0.000	kip/ft	W Overlay	0.000	kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	TxDOT 2010
(Allowable compression stress factor at release = 0.65)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN				NON-STANDARD STRAND PATTERNS					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (SERVICE I)	DESIGN LOAD TENSILE STRESS (SERVICE II)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (SERVICE III)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT E OF GIRDER				
					TOTAL NO.	SIZE	STRENGTH	"a" TOP (in)	"e" END (in)	DEPRESSED NO.	TO (in)									RELEASE STRENGTH (1) f' (ksi)	MINIMUM 28 DAY COMP STRENGTH (c' (ksi)
					(in)	(ksi)	(in)	(in)	(in)												
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	(4)	A(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) B(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)	
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	(5)	A(2,5, 4,5, 6,5, 8,5, 10,5)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) f _{cb} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) M _u	LIVE LOAD DISTRIBUTION FACTOR			
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED					RELEASE STRENGTH (1) f' _{ci} (ksi)	MINIMUM 28 DAY COMP STRENGTH f' _c (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, (see NHPCC) if shown, must be Grade 60, has the option of a strand girder or design submittals stored

longer must have greater than that

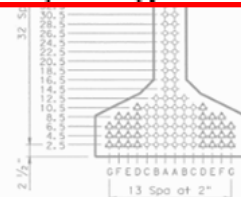
has been percent. Optional

strands must be system unless a full row "2.5", using each row till the required in the "A" e 2" spacing so ronds are in the low relaxation each, .05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand 1-length depressed row. Full-length F.4.

ING



TYPE Tx62 & Tx70

Nicholas Nemecek

 3/24/2011

Texas Department of Transportation

 Bridge Division

PRESTRESSED CONCRETE

I-GIRDER DESIGNS

 (NON-STANDARD SPANS)

IGND

File: Ignstdet.dgn	Rev: 001	Rev: 1001	Rev: 258	Rev: 1001
01/01/01 June 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	ELP	446		
02/01/01 General Notes				
10/01/01 General Notes				
12/01/01 Add Streets & L&D.				
	COUNTY	CONTRACT	SECT	JOB
	EL PASO	2552	03	034 LP

File View Help



Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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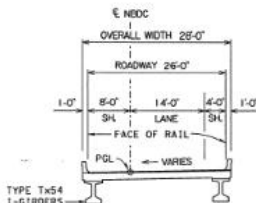
Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	



ADT = 5,800 (2015) 5,900 (2035) 10,900 (2045)
 DESIGN SPEED = 40 MPH
 FUNCTIONAL CLASSIFICATION: MINOR ARTERIAL
 PERM. STRUCT. NO. 24-072-0-2552-03-291

ALL ABUTMENTS AND INTERIOR BENTS ARE PERPENDICULAR TO ALIGN NBDC



TYPICAL TRANSVERSE SECTION



BRIDGE DESIGN
Thomas Stout
 03-04-2011



ROADWAY DESIGN
Chad Romero
 SCALE 3/4"=1'
 HORIZONTAL 1"=40'
 VERTICAL 1"=20'

Texas Department of Transportation
 © 2011 TxDOT

BRIDGE LAYOUT
 NB DIRECT CONNECTOR

SHEET 2 OF 6

FED. AID PROJ. NO.	FEDERAL AID PROJECT		SHEET
6			344
STATE	DIST.	COUNTY	
TEXAS	ELP	EL PASO	
CONTR.	SECT.	JOB	ROADWAY NO.
2552	03	034	LP375

LP 375 NB CONN. MATCH LINE STA 120+60

LP 375 NB CONN. MATCH LINE STA 125+40

Curve NEC4
 P.I. Station 121+43.940
 Delta 1° 38' 56.652" (LT)
 Degree 1° 00' 18.948"
 Tangent 620.275
 Length 164.0437
 Radius 5,999.5780
 External 0.5902

Long Chord = 164.0380
 Mid. Ord. = 0.5902
 P.C. Station 120+61.8665
 P.T. Station 122+25.9102
 Back S 44° 45' 12.0900" W
 Ahead S 47° 06' 15.4359" W
 Chord Bear S 47° 55' 43.7640" W

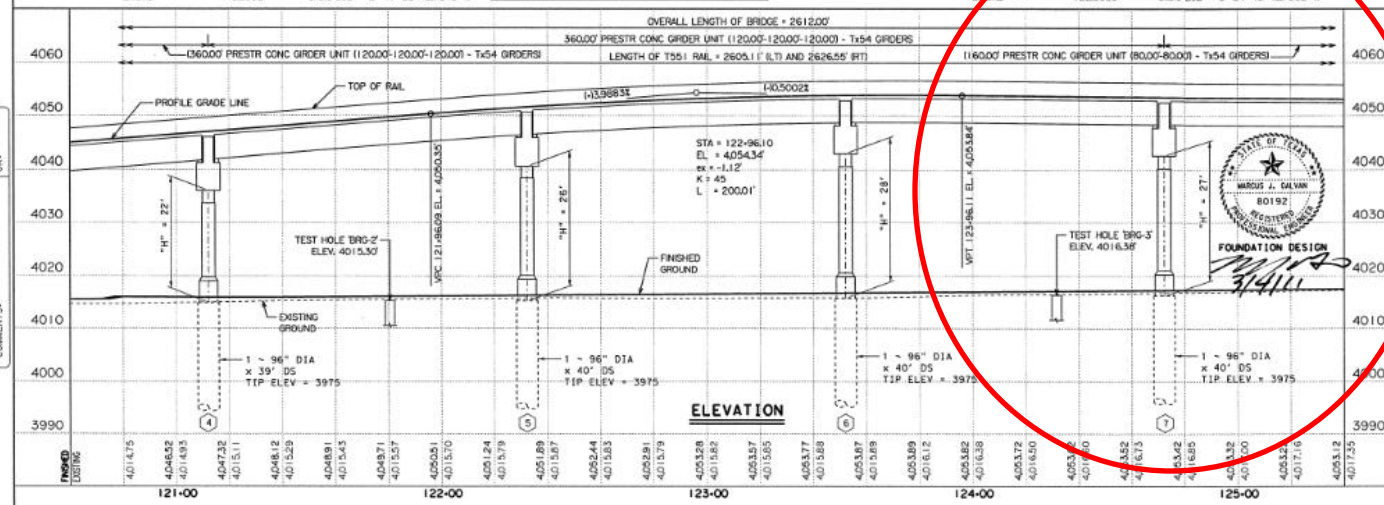
PLAN

THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING THE ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS

Curve NEC5
 P.I. Station 124+31.650
 Delta 3° 47' 04.8212" (LT)
 Degree 3° 47' 04.8212"
 Tangent 620.1451
 Length 1,177.1560
 Radius 12,513.8900
 External 1.220930

Long Chord = 1247.7240
 Mid. Ord. = 112.413
 P.C. Station 124+77.622
 P.T. Station 126+54.7772
 Back S 47° 06' 15.4359" W
 Ahead S 2° 33' 10.0365" W
 Chord Bear S 2° 44' 42.7362" W

FILE NAMES: T&S41Y02.dgn
 DATE: 02/20/11
 TCS
 DWG
 CHK
 TIG
 COMMENTS



ELEVATION

File View Help



Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

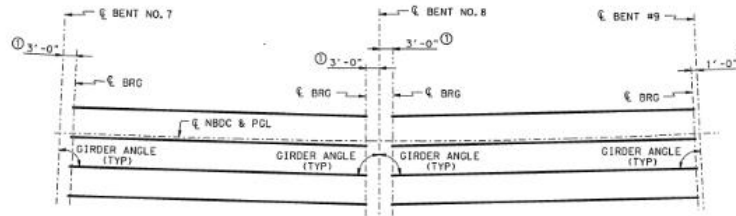
Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





SPAN 7
(TX54 GIRDERS)

SPAN 8
(TX54 GIRDERS)

BENT REPORT

BENT NO. 7 (IN 42 53 44.56 W)			
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L			
	GIRDER SPAC.	GIRDER ANGLE	
	(C.L. BENT)	D M S	
SPAN 7 GIRDER 1	0.000	88 41 2	
GIRDER 2	7.333	88 41 0	
GIRDER 3	7.333	88 40 59	
GIRDER 4	7.333	88 40 57	
TOTAL	22.000		

BENT NO. 8 (IN 45 43 8.51 W)			
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L			
	GIRDER SPAC.	GIRDER ANGLE	
	(C.L. BENT)	D M S	
SPAN 7 GIRDER 1	0.000	88 29 33	
GIRDER 2	7.333	88 29 35	
GIRDER 3	7.333	88 29 36	
GIRDER 4	7.333	88 29 36	
TOTAL	22.000		

SPAN 8 GIRDER 1	0.000	88 29 10
GIRDER 2	7.333	88 29 10
GIRDER 3	7.333	88 29 10
GIRDER 4	7.333	88 29 10
TOTAL	22.000	

BENT NO. 9 (IN 48 44 48.36 W)			
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L			
	GIRDER SPAC.	GIRDER ANGLE	
	(C.L. BENT)	D M S	
SPAN 8 GIRDER 1	0.000	88 29 10	
GIRDER 2	7.333	88 29 10	
GIRDER 3	7.333	88 29 10	
GIRDER 4	7.333	88 29 10	
TOTAL	22.000		

GIRDER REPORT

GIRDER REPORT, SPAN 7			
	HORIZONTAL DISTANCE	TRUE DISTANCE	GIRDER
	C-C BENT	C-C BRG.	BOT. GR. FLG. ②
GIRDER 1	79.695	73.693	75.19 -0.0050
GIRDER 2	80.067	74.065	75.56 -0.0050
GIRDER 3	80.418	74.416	75.92 -0.0050
GIRDER 4	80.779	74.777	76.28 -0.0050

GIRDER REPORT, SPAN 8			
	HORIZONTAL DISTANCE	TRUE DISTANCE	GIRDER
	C-C BENT	C-C BRG.	BOT. GR. FLG. ②
GIRDER 1	79.674	75.673	77.17 -0.0050
GIRDER 2	80.061	76.060	77.56 -0.0050
GIRDER 3	80.449	76.448	77.95 -0.0049
GIRDER 4	80.836	76.835	78.34 -0.0049

- ① SEE IGEB STANDARD FOR ORIENTATION OF DIMENSION.
② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.



Nicholas Neme
3/4/2011

Texas Department of Transportation
Bridge Division

GIRDER LAYOUT

(SPANS 7 - 8)

NB DIRECT CONNECTOR

FILE: Y347D101.dgn	DR: NBB	CL:	DR: TEW	CL: NBB
TARGET: FEB 2011	DISTRICT:	FEDERAL AID PROJECT:	SHEET:	
REVISIONS:	ELP	COUNTY:	CONTROL SECT:	ASB
	EL: P650	1552	03	034 (LP375)

GIRDER REPORT, SPAN 7

	HORIZONTAL DISTANCE	TRUE DISTANCE	GIRDER SLOPE
C-C BENT	C-C BRG.	BOT. GR. FLG. ②	
GIRDER 1	79.695	73.693	-0.0050
GIRDER 2	80.057	74.055	-0.0050
GIRDER 3	80.418	74.416	-0.0050
GIRDER 4	80.779	74.777	-0.0050

SPAN 8
(TX54 GIRDERS)

BENT REPORT

BENT NO. 7 (IN 42' 56" R)

DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

SPAN	T GIRDER	GIRDER SPAC. (C-L, BENT)	GIRDER ANGLE (D M S)
SPAN 7	GIRDER 1	0.000	88 41 2
	GIRDER 2	7.333	88 41 0
	GIRDER 3	7.333	88 40 59
	GIRDER 4	7.333	88 40 57
TOTAL		22.000	

BENT NO. 8 (IN 45' 8.51" R)

DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

SPAN	T GIRDER	GIRDER SPAC. (C-L, BENT)	GIRDER ANGLE (D M S)
SPAN 7	GIRDER 1	0.000	88 29 33
	GIRDER 2	7.333	88 29 35
	GIRDER 3	7.333	88 29 36
	GIRDER 4	7.333	88 29 38
TOTAL		22.000	

BENT NO. 9 (IN 48' 44.36" R)

DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

SPAN	T GIRDER	GIRDER SPAC. (C-L, BENT)	GIRDER ANGLE (D M S)
SPAN 8	GIRDER 1	0.000	88 29 10
	GIRDER 2	7.333	88 29 10
	GIRDER 3	7.333	88 29 10
	GIRDER 4	7.333	88 29 10
TOTAL		22.000	

GIRDER REPORT

GIRDER REPORT, SPAN 7

	HORIZONTAL DISTANCE	TRUE DISTANCE	GIRDER SLOPE
C-C BENT	C-C BRG.	BOT. GR. FLG. ②	
GIRDER 1	79.695	73.693	-0.0050
GIRDER 2	80.057	74.055	-0.0050
GIRDER 3	80.418	74.416	-0.0050
GIRDER 4	80.779	74.777	-0.0050

- ① SEE ICEE STANDARD FOR ORIENTATION OF DIMENSION.
- ② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.



Nicholas Neme
3/4/2011

Texas Department of Transportation
Bridge Division

GIRDER LAYOUT
(SPANS 7 - 8)
NB DIRECT CONNECTOR

FILE: 13430101.dgn	REV: 000	DATE: 03/04/2011	BY: TWR	CHK: NMS
DATE: FEB 2011	DESCRIPTION: GENERAL AND PRELIMINARY	SHEET: 1		
PROJECT: 13430101	SHEET: 1	DATE: 03/04/2011	BY: TWR	CHK: NMS
FILE: 13430101.dgn	REV: 000	DATE: 03/04/2011	BY: TWR	CHK: NMS



General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text"/>
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

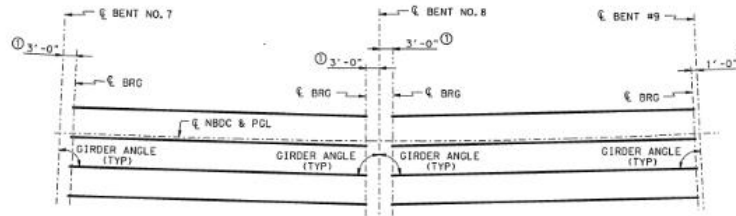
Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





SPAN 7
(TX54 GIRDERS)

SPAN 8
(TX54 GIRDERS)

BENT REPORT

BENT NO. 7 (IN 42 53 44.26 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L
GIRDER SPAC. GIRDER ANGLE
(C.L. BENT) D M S
SPAN 7 GIRDER 1 0.000 88 41 2
GIRDER 2 7.333 88 41 0
GIRDER 3 7.333 88 40 59
GIRDER 4 7.333 88 40 57
TOTAL 22.000

BENT NO. 8 (IN 45 43 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L
GIRDER SPAC. GIRDER ANGLE
(C.L. BENT) D M S
SPAN 7 GIRDER 1 0.000 88 29 33
GIRDER 2 7.333 88 29 35
GIRDER 3 7.333 88 29 36
GIRDER 4 7.333 88 29 38
TOTAL 22.000

SPAN 8 GIRDER 1 0.000 88 29 10
GIRDER 2 7.333 88 29 10
GIRDER 3 7.333 88 29 10
GIRDER 4 7.333 88 29 10
TOTAL 22.000

BENT NO. 9 (IN 48 44 48.36 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L
GIRDER SPAC. GIRDER ANGLE
(C.L. BENT) D M S
SPAN 8 GIRDER 1 0.000 88 29 10
GIRDER 2 7.333 88 29 10
GIRDER 3 7.333 88 29 10
GIRDER 4 7.333 88 29 10
TOTAL 22.000

GIRDER REPORT

GIRDER REPORT, SPAN 7
HORIZONTAL DISTANCE TRUE DISTANCE GIRDER
C-C BENT C-C BRG. BOT. GR. FLG. ② SLOPE
GIRDER 1 79.695 73.693 75.19 -0.0050
GIRDER 2 80.067 74.065 75.56 -0.0050
GIRDER 3 80.418 74.416 75.92 -0.0050
GIRDER 4 80.779 74.777 76.28 -0.0050

GIRDER REPORT, SPAN 8
HORIZONTAL DISTANCE TRUE DISTANCE GIRDER
C-C BENT C-C BRG. BOT. GR. FLG. ② SLOPE
GIRDER 1 79.674 75.673 77.17 -0.0050
GIRDER 2 80.061 76.060 77.56 -0.0050
GIRDER 3 80.449 76.448 77.95 -0.0049
GIRDER 4 80.836 76.835 78.34 -0.0049

- ① SEE IGEB STANDARD FOR ORIENTATION OF DIMENSION.
② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.



Nicholas Neme
3/4/2011

Texas Department of Transportation
Bridge Division

GIRDER LAYOUT

(SPANS 7 - 8)

NB DIRECT CONNECTOR

FILE: Y347D101.dgn	DR: NBB	CL:	DR: TWR	CL: NBB
TARGET: FEB 2011	DISTRICT:	FEDERAL AID PROJECT:	SHEET:	
REVISIONS:	ELP	COUNTY:	CONTROL SECT:	ASB
	EL: P650	1552	03	034 (LP375)



BENT NO. 7 (N 42 53 44.56 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

GIRDER SPAC.		GIRDER ANGLE	
(C.L. BENT)		D	M S
SPAN 7 GIRDER 1	0.000	88 41	2
GIRDER 2	7.333	88 41	0
GIRDER 3	7.333	88 40	59
GIRDER 4	7.333	88 40	57
TOTAL	22.000		

BENT NO. 8 (N 45 43 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

GIRDER SPAC.		GIRDER ANGLE	
(C.L. BENT)		D	M S
SPAN 7 GIRDER 1	0.000	88 29	33
GIRDER 2	7.333	88 29	35
GIRDER 3	7.333	88 29	36
GIRDER 4	7.333	88 29	38
TOTAL	22.000		

BENT REPORT

BENT NO. 7 (N 42 53 44.56 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

GIRDER SPAC.		GIRDER ANGLE	
(C.L. BENT)		D	M S
SPAN 7 GIRDER 1	0.000	88 41	2
GIRDER 2	7.333	88 41	0
GIRDER 3	7.333	88 40	59
GIRDER 4	7.333	88 40	57
TOTAL	22.000		

BENT NO. 8 (N 45 43 8.51 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

GIRDER SPAC.		GIRDER ANGLE	
(C.L. BENT)		D	M S
SPAN 7 GIRDER 1	0.000	88 29	33
GIRDER 2	7.333	88 29	35
GIRDER 3	7.333	88 29	36
GIRDER 4	7.333	88 29	38
TOTAL	22.000		

SPAN 8

GIRDER 1	0.000	88 29	10
GIRDER 2	7.333	88 29	10
GIRDER 3	7.333	88 29	10
GIRDER 4	7.333	88 29	10
TOTAL	22.000		

BENT NO. 9 (N 48 44 48.36 W)
DISTANCE BETWEEN STATION LINE AND GIRDER 1 6.000 L

GIRDER SPAC.		GIRDER ANGLE	
(C.L. BENT)		D	M S
SPAN 8 GIRDER 1	0.000	88 29	10
GIRDER 2	7.333	88 29	10
GIRDER 3	7.333	88 29	10
GIRDER 4	7.333	88 29	10
TOTAL	22.000		

GIRDER REPORT, SPAN 8

GIRDER	HORIZONTAL DISTANCE		TRUE DISTANCE	GIRDER SLOPE
	C-C BENT	C-C BRG.		
GIRDER 1	79.699	73.693	75.19	-0.0050
GIRDER 2	80.057	74.055	75.56	-0.0050
GIRDER 3	80.418	74.416	75.92	-0.0050
GIRDER 4	80.779	74.777	76.28	-0.0050

- ① SEE ICEB STANDARD FOR ORIENTATION OF DIMENSION.
② GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.



Nicholas Neme
3/4/2011

Texas Department of Transportation
Bridge Division

GIRDER LAYOUT

(SPANS 7 - 8)

NB DIRECT CONNECTOR

FILE: 13430101.dgn	REV: 000	DATE: 03/04/2011	BY: TCR	CHK: NMS
DATE: FEB 2011	DESCRIPTION: REBAR AND BRIDGE	SCALE: 1/8"=1'-0"	SHEET: 1	
PROJECT: 13430101	SHEET: 001	DATE: 03/04/2011	BY: TCR	CHK: NMS

File View Help



Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/>	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*fc, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

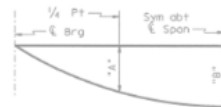
W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	



Span No.	Girder No.	"A" at $\frac{1}{4}$ Span	"B" at $\frac{3}{4}$ Span
7	1 - 4	0.019	0.027
8	1 - 4	0.021	0.030



DEAD LOAD DEFLECTION DIAGRAM

NOTE: Deflection shown are due to concrete slab only, ($E_c = 5 \times 10^6$ psi). Calculated deflections shown are theoretical and actual dimensions may be less. Deflections shall be adjusted based on field observations.

TABLE OF SECTION DEPTHS				
Span No.	Girder No.	"x" at $\frac{1}{4}$ Span	"y" at $\frac{3}{4}$ Span	"z" at $\frac{1}{2}$ Span
7	1 - 4	11 $\frac{1}{2}$ "	5'-5 $\frac{1}{2}$ "	10"
8	1 - 4	11 $\frac{1}{2}$ "	5'-5 $\frac{1}{2}$ "	10"

① Theoretical dimension

TABLE OF ESTIMATED QUANTITIES				
SPAN	REINFORCED CONCRETE SLAB (HPC) (CL. 5)	PRESTR. CONC I-GIRDERS (TXS4) ⑤	CLASS "S" CONCRETE (HPC)	REINFORCING STEEL
NO.	SF	LF	CY	LB
7	2247 ⑥	302.95	66.2	14606
8	2247	311.02	65.5	14606
TOTAL	4494	613.97	131.7	29212 ④

- ④ Reinforcing steel weight is calculated using an approximate factor of 6.5 Lbs per Sq Ft.
 ⑤ Lengths shown are bottom girder flange lengths with adjustments made for beam slope. See GIRDER LAYOUT for girder lengths.
 ⑥ Includes 56 SF of slab on the top of Bent No. 7.

BAR TABLE	
BAR	SIZE
A	#5
B	#5
D	#5
G	#5
H	#5
J	#5
M	#5
T	#4
W	#4
Y	#4
Z	#4

GENERAL NOTES:

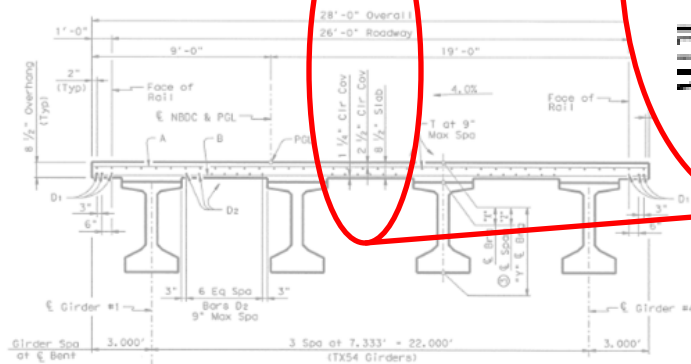
- Designed according to AASHTO LRFD Bridge Design Specifications, 5th Edition (2010).
 See PCP or PDF standards for details and quantity adjustments if either of these options are used.
 See IGTS standard for Thickened Slab End details.
 See IGMS(MOD) standard for miscellaneous details not shown.
 All reinforcing steel shall be Grade 60. Concrete shall be Class "S" (HPC). Concrete strength $f'_c = 4000$ psi.
 Bar laps, where required, shall be as follows: #4 = 1'-5"
 #5 = 1'-9"
 See rolling details for rail anchorage in slab.

HL93 LOADING

SHEET 2 OF 2

Texas Department of Transportation
 Bridge Division
160.00' PRESTRESSED CONCRETE I-GIRDER UNIT
 (SPANS 7 & 8)
NB DIRECT CONNECTOR

FILED: 23432021.dgn	DATE: APR 2011	BY: TWP	NO. 1070
01 APR 2011	01 APR 2011	01 APR 2011	01 APR 2011
01 APR 2011	01 APR 2011	01 APR 2011	01 APR 2011
01 APR 2011	01 APR 2011	01 APR 2011	01 APR 2011



TYPICAL TRANSVERSE SECTION

A* Contractor's option, alternating bars A may end at $\frac{1}{4}$ Outside Girders (Typ)



Nicholas Nemes
 3/4/2011



General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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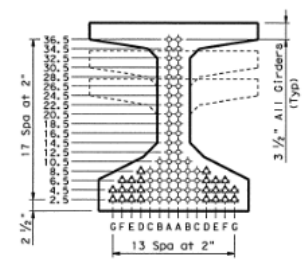
Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	

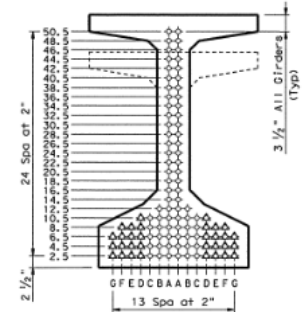


ENTLS DISPLAYED	ACCT
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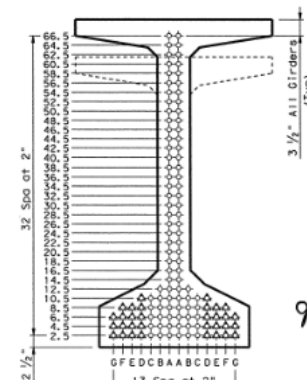
STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN						
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STB STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMP STRESS (TOP 4) (SERVICE 1)	DESIGN LOAD TENSILE STRESS (BOTTOM 3) (SERVICE 1)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-LIPS)	LIVE LOAD DISTRIBUTION FACTOR (2)		
					TOTAL NO.	SIZE	STRGTH f _{pu} (ksi)	"a" f _c (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH f _{cr} (ksi)				MINIMUM 28 DAY COMP STRENGTH f _c (ksi)	MOMENT	SHEAR
										NO.	TO							
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5,600	7,400	4,549	-4,394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5,400	7,100	4,399	-4,255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5,400	6,100	3,906	-3,944	7752	0.591	0.761
	7-8 & 12-13	ALL	Tx54		22	½	270	20.28	19.19	4	10.5	4,000	5,000	1,829	-1,948	4110	0.656	0.761
	14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4,000	5,000	2,345	-2,479	5200	0.688	0.761
	15	ALL	Tx54		66	½	270	17.07	10.52	12	48.5	5,800	6,400	4,008	-4,128	8367	0.688	0.761
21	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5,600	6,300	4,026	-4,058	7954	0.588	0.761	
SOUTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5,600	7,400	4,549	-4,394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5,400	7,100	4,399	-4,255	6443	0.528	0.634
	3-8 & 16-18	ALL	Tx54		60	½	270	17.61	10.94	10	50.5	5,400	6,100	3,906	-3,945	7754	0.591	0.761
	9&14	ALL	Tx54		30	½	270	19.81	17.41	6	18.5	4,000	5,000	2,384	-2,490	5122	0.633	0.761
	13	ALL	Tx54		34	½	270	19.48	16.65	6	22.5	4,000	5,000	2,583	-2,682	5474	0.625	0.761
	15	ALL	Tx54		68	½	270	16.83	9.42	14	50.5	5,800	6,400	4,068	-4,211	8594	0.718	0.761
19	ALL	Tx54		62	½	270	17.46	11.01	10	50.5	5,600	6,300	4,026	-4,059	7956	0.588	0.761	



TYPE Tx28, Tx34 & Tx40^③



TYPE Tx46 & Tx54⁽³⁾



TYPE Tx62 & Tx70⁽³⁾

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT E OF CIRCLE
(4)	A(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) B(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)
(5)	A(2,5, 4,5, 6,5, 8,5, 10,5) B(2,5, 4,5, 6,5, 8,5, 10,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)

GENERAL NOTES:

Designed in accordance with the ASHTO LRFD Specifications.
All concrete must be Class H. Provide Class H (HPC) if shown elsewhere in plans. All reinforcing bars must be Grade 60.
When shown on this sheet, the Fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a registered Professional Engineer.

Optional design for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless a Non-Standard Strand Pattern is indicated. Fill gap 2.5".

then row "4.5", then row "5.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A"

position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.

Seal cracks in girder ends exceeding 0.005" in width as

directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the

additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form.

corrective action if cracks greater than 0.005" form on a repetitive basis.

① Based on the following allowable stresses (ksi):

Compression = $0.65 f'_{ci}$
Tension = $0.24 \sqrt{f'_{ci}}$

Optional designs must likewise conform.

③ Full-length debonded strands are only permitted in strand

③ Full-length debonded strands are only permitted in strand positions marked Δ . Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.5.4.

debonding must comply with Item 426.4.F.4.

HL93 LOADING



PRESTRESSED CONCRETE I-GIRDER DESIGNS (NON-STANDARD SPANS)

IGND

FILED	10ndstetl.dgn	EN: JMH	CR: Tx00T	EN: JTR	CR: Tx00T
Tx00T June 2007		DISTRICT	FEDERAL AID PROJECT		
REVISIONS		ELP	SHEET		
02/09/ General Nolas.		COUNTY	44		
10/09/ General Nolas.		CONTR.	SEL.	JOB	HIGHWAY
12/09/ Neil Sengels & LLC.		FL PASO	255.2	0.3	0.34 1 P. 32

Rev: SEA 03-23-11

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act" and the "Texas Professional Engineers Act". The user of this standard is responsible for its proper use. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or omissions resulting from its use.

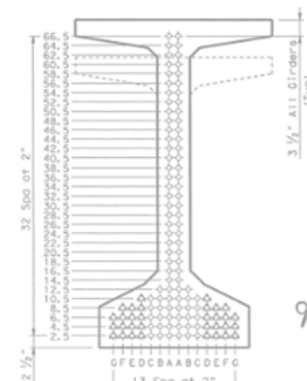
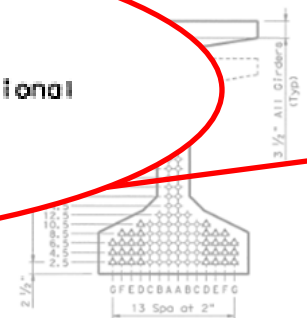
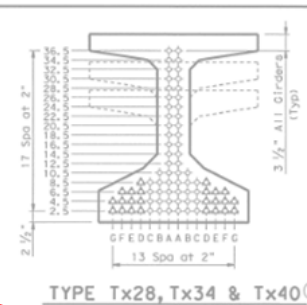
LEVELS: SUPPLY

ACCY

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD PATTERN	PRESTRESSING STRANDS					CONCRETE			DESIGN LOAD COMPRESSION STRESS (TOP OF SERVICE 1) (ksi)	DESIGN LOAD TENSION STRESS (BOTTOM OF SERVICE 1) (ksi)	REQUIRED MINIMUM ULTIMATE CAPACITY (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR	Shear	
					TOTAL NO.	SIZE	STRENGTH (ksi)	"e" (in)	"e" (in)	DEPRESSED NO.	TO	RELEASE STRENGTH (ksi)						MINIMUM 28 DAY COMP STRENGTH (ksi)
					(in)	(ksi)	(in)	(in)	(in)	(in)	(ksi)	(ksi)	(ksi)	(ksi)	(ft-kips)	Moment		
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	33.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.63
	2	ALL	Tx46	(5)	44	0.6	270	33.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.63
	3-6 & 16-20	ALL	Tx54		60	1/2	270	37.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.76
	7-8 & 12-13	ALL	Tx54		22	1/2	270	30.38	10.10	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.76
SOUTHBOUND DIRECT CONNECTOR	9&14	ALL	Tx54		34	1/2	270	37.61	10.94	10	50.5	5.800	6.400	4.068	-4.211	8594	0.625	0.76
	13	ALL	Tx54		68	1/2	270	36.83	9.42	14	50.5	5.800	6.400	4.068	-4.211	8594	0.625	0.76
	15	ALL	Tx54		68	1/2	270	36.83	9.42	14	50.5	5.800	6.400	4.068	-4.211	8594	0.625	0.76
	19	ALL	Tx54		62	1/2	270	37.46	11.01	10	50.5	5.600	6.300	4.026	-4.059	7956	0.588	0.76

of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.



NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT E OF GIRDER
(4)	A(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) B(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)
(5)	A(2,5, 4,5, 6,5, 8,5, 10,5) B(2,5, 4,5, 6,5, 8,5, 10,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Specifications. All concrete must be Class H. Provide Class HRPC if shown elsewhere in plans. All reinforcing bars must be Grade 60. When shown on this sheet, the fabricator has the option of furnishing either the designed depressed strand girder or an approved optional design. All optional design submittals must be stamped, sealed and dated by a registered Professional Engineer.

Optional designs must be submitted and approved. All optional designs must have a minimum residual capacity equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

For depressed strand designed girders, strands must be located as low as possible on the 2" grid system unless otherwise indicated. Strand pattern is indicated by the "A" then row "4,5, 6,5, 8,5, 10,5, 12,5" following each row in the "A" girder is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.

Strands for the designed girder must be low relaxation strands pretensioned to 75 percent of f_{pu} each. Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'_{ci}

Tension = 0.24 $\sqrt{f'_{ci}}$

Optional designs must likewise conform.

(2) Portion of full HL93.

(3) Full-length debonded strands are only permitted in strand positions marked Δ . Double wrap full-length debonded strands in outermost position of each row. Full-length debonding must comply with Item 426.4.F.4.



Nicholas Nemecek
3/24/2011

HL93 LOADING

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: igndetel.dgn	Rev: JBR	Rev: TxDOT	Rev: JBR	Rev: TxDOT
10/01/07	June 2007	ESTIMATED	REVISIONS AND PROJECT	444
DESIGNED BY: JBR	DESIGNED BY: JBR	DESIGNED BY: JBR	DESIGNED BY: JBR	DESIGNED BY: JBR
10/01/07	June 2007	ESTIMATED	REVISIONS AND PROJECT	444

Revised 03-23-11



General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text" value="60"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

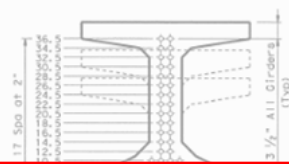
W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN						<div><div>17.500 FT 2"</div><div>3 1/2" All Girders (Type)</div></div>	NON-STANDARD STRAND PATTERNS	
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) (Ft/Kip)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE II) (Ft/Kip)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (Ft-Kip)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN		STRAND ARRANGEMENT AT ϵ OF GIRDER	
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED NO.	TO (in)	RELEASE STRENGTH (1) (ksi)								MINIMUM 28 DAY COMP. STRENGTH (ksi)
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)	
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	A(2.5, 4.5, 6.5, 8.5, 10.5) B(2.5, 4.5, 6.5, 8.5, 10.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE II) f _{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f' _{ol} (ksi)				MINIMUM 28 DAY COMP. STRENGTH f' _c (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

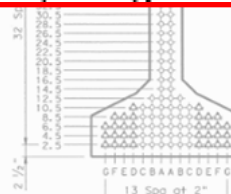
Specifications, loss (NRCPI) if shown must be Grade 60, has the option of strand girder or design submittals.

longer than the greater than that is have been percent. Optional strands must be system unless a full row "2.5", filling each row fill the required in the "A" e 2" spacing so rands are in the low relaxation each, .05" in width as is permitted providing provided the 1" clear approved .005" form

uses (ksi):

permitted in strand -length discarded row. Full-length F.4.

ING



NICHOLAS NEMEC

 102288

 LICENSED

 Nicholas Nemece

 3/24/2011

Texas Department of Transportation

 Bridge Division

PRESTRESSED CONCRETE

I-GIRDER DESIGNS

 (NON-STANDARD SPANS)

IGND			
File: Ignstdet.dgn	Rev: JBR	Rev: TxDOT	Rev: JBR
10/20/07	June 2007	February	February
DESIGN: General Notes	ELP	DESIGN: General Notes	ELP
10/20/07: Rev: JBR	EL PASO	2552	63
10/20/07: Rev: JBR	EL PASO	2552	63

TYPE Tx62 & Tx70

Revised 03-23-11



General Information

Bridge	NB Direct Connector	Engineer	T Retterer
Bridge ID		Company	TxDOT
Job Number	2552-03-034	Comments	

Design Information

Span No.	7	Span Length (CL Bearings)	74.777	ft	Relative Humidity	60	%
Beam No.	1-4	Beam Spacing	7.333	ft	LLDF (Moment)	0.656	
Beam Type	Tx54	Slab Thickness	8.5	in	LLDF (Shear)		

Material Properties

Ec, Slab	5000.000	KSI	Ec, Beam	5000.000	KSI	f'c, Slab	4.000	KSI
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Design Data

*ft, Design Compressive Stress, Top CL		KSI	*fb, Design Tensile Stress, Bottom CL		KSI
Mu, Required Ultimate Moment Capacity		kip-ft	* Note: Tension is negative		

Optional Uniform Design Loads

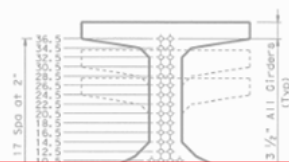
W non-comp, DC	0.000	kip/ft	W comp, DC	0.000	kip/ft	W Overlay	0.000	kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	TxDOT 2010
(Allowable compression stress factor at release = 0.65)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN				NON-STANDARD STRAND PATTERNS			
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMP. STRESS (TOP ϵ) (SERVICE I) (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIP) (I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2)	PATTERN	STRAND ARRANGEMENT AT ϵ OF GIRDER	
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED NO.	TO (in)	RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP. STRENGTH (ksi)					
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMP. STRESS (TOP ϵ) (SERVICE I) f_{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) f_{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f_{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f'_{ci} (ksi)				MINIMUM 28 DAY COMP. STRENGTH f'_{cd} (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, loss (HNPCC) if shown just be Grade 60, has the option of strand girder or sign submittals steel.

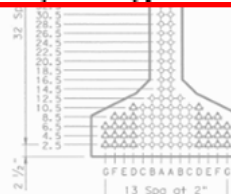
longer must be greater than that is have been percent. Optional

strands must be 18" from unless a 18" row "2.5", minimum row 18" the required in the "A" e 2" spacing so ronds are in the low relaxation each. .05" in width as is permitted providing the shear approved .005" form

ases (ksi):

permitted in strand 1-length depressed row. Full-length F.4.

ING



NICHOLAS NEMEC

 102288

 LICENSED

 Nicholas Nemece

 3/24/2011

Texas Department of Transportation

 Bridge Division

PRESTRESSED CONCRETE

I-GIRDER DESIGNS

 (NON-STANDARD SPANS)

IGND			
File: Ignstdet.dgn	Rev: JBR	Rev: TxDOT	Rev: JBR
10/20/07	June 2007	February	February
DESIGNED	BY: JBR	CHECKED	BY: JBR
10/20/07	June 2007	February	February
10/20/07	June 2007	February	February

Revised 03-23-11

TYPE Tx62 & Tx70



General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text" value="60"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text" value="0.656"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text" value="0.767"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text" value="60"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text" value="0.656"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text" value="0.767"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/>	KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/>	KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/>	kip-ft	* Note: Tension is negative		


Optional Uniform Design Loads

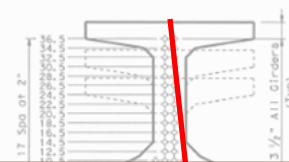
W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN						<div></div>		NON-STANDARD STRAND PATTERNS		
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMPRESSION STRESS (TOP & BOTTOM) (SERVICE I) (ksi)	DESIGN LOAD TENSION STRESS (BOTTOM) (SERVICE II) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (SERVICE I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR							
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)	DEPRESSED NO.	TO (in)				RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP STRENGTH (ksi)	②					
																	Moment					Shear
1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634					
2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634					



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMP STRESS (TOP & BOTTOM) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM) (SERVICE II) f _{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (SERVICE I) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR (2)		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"e" Ć (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f'c _i (ksi)				MINIMUM 28 DAY COMP STRENGTH f'c (ksi)	Moment	Shear
										NO.	TO (in)							
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, less (NHPCC) if shown, has the option of a strand girder or design submittals stored

longer must have greater than that

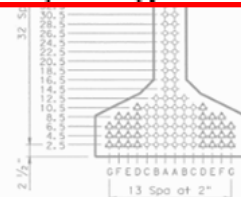
has been percent. Optional

strands must be system unless a full row "2.5", noting each row till the required in the "A" e 2" spacing so ronds are in the low relaxation each. 05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand 1-length depressed row. Full-length F.4.

ING



TYPE Tx62 & Tx70



Nicholas R. Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdetl.dgn	Rev: JBR	Rev: TJO	Rev: JBR	Rev: TJO
10/20/07	June 2007	10/20/07	June 2007	10/20/07
DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes
10/20/07: See Design & LOP	10/20/07: See Design & LOP	10/20/07: See Design & LOP	10/20/07: See Design & LOP	10/20/07: See Design & LOP



General Information

Bridge	NB Direct Connector	Engineer	T Retterer
Bridge ID		Company	TxDOT
Job Number	2552-03-034	Comments	

Design Information

Span No.	7	Span Length (CL Bearings)	74.777	ft	Relative Humidity	60	%
Beam No.	1-4	Beam Spacing	7.333	ft	LLDF (Moment)	0.656	
Beam Type	Tx54	Slab Thickness	8.5	in	LLDF (Shear)	0.767	

Material Properties

Ec, Slab	5000.000	KSI	Ec, Beam	5000.000	KSI	f'c, Slab	4.000	KSI
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Design Data

*ft, Design Compressive Stress, Top CL	1.829	KSI	*fb, Design Tensile Stress, Bottom CL		KSI
Mu, Required Ultimate Moment Capacity		kip-ft	* Note: Tension is negative		

Optional Uniform Design Loads

W non-comp, DC	0.000	kip/ft	W comp, DC	0.000	kip/ft	W Overlay	0.000	kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	TxDOT 2010
(Allowable compression stress factor at release = 0.65)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN						NON-STANDARD STRAND PATTERNS					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIP)	LIVE LOAD DISTRIBUTION FACTOR		PATTERN	STRAND ARRANGEMENT AT ϵ OF GIRDER				
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED NO.	TO (in)				RELEASE STRENGTH (ksi) (1)	MINIMUM 28 DAY COMP. STRENGTH (ksi) (2)					MOMENT (2)	Shear
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	(4)	A(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) B(2,5, 4,5, 6,5, 8,5, 10,5, 12,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)		
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	(5)	A(2,5, 4,5, 6,5, 8,5, 10,5) B(2,5, 4,5, 6,5, 8,5, 10,5) C(2,5, 4,5, 6,5, 8,5, 10,5) D(2,5, 4,5, 6,5, 8,5, 10,5) E(2,5, 4,5)		



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) f _{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f' _{ci} (ksi)				MINIMUM 28 DAY COMP STRENGTH f' _c (ksi)	LIVE LOAD DISTRIBUTION FACTOR (2)	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, as H(NPC) if shown must be Grade 60, has the option of a strand girder or design submittal stored

longer must have greater than that

s have been percent. Optional

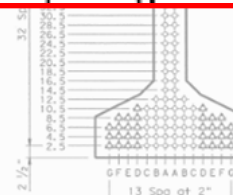
strands must be system unless a full row "2.5", using each row all the required in the "A" e 2" spacing so strands are in the row relaxation each. 05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

h.

permitted in strand -length debonded row. Full-length F.4.

TING



TYPE Tx62 & Tx70



Nicholas Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdet.dgn	Rev: JNH	Rev: T001	Rev: JTR	Rev: T001
T001 June 2001	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	ELP	499		
02/01/01 General Notes				
10/01/01 General Notes	COUNTY	CONTROL	SELF	JOB
12/01/01 Ref. Sargent & Lundy	EL PASO	2552	03	034
			034	14



Bridge Input | Girder Input | Girder View | Analysis Report

General Information

Bridge	NB Direct Connector	Engineer	T Retterer
Bridge ID		Company	TxDOT
Job Number	2552-03-034	Comments	

Design Information

Span No.	7	Span Length (CL Bearings)	74.777	ft	Relative Humidity	60	%
Beam No.	1-4	Beam Spacing	7.333	ft	LLDF (Moment)	0.656	
Beam Type	Tx54	Slab Thickness	8.5	in	LLDF (Shear)	0.767	

Material Properties

Ec, Slab	5000.000	KSI	Ec, Beam	5000.000	KSI	f'c, Slab	4.000	KSI
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Design Data

*ft, Design Compressive Stress, Top CL	1.829	KSI	*fb, Design Tensile Stress, Bottom CL	-1.948	KSI
Mu, Required Ultimate Moment Capacity		kip-ft	* Note: Tension is negative		

Optional Uniform Design Loads

W non-comp, DC	0.000	kip/ft	W comp, DC	0.000	kip/ft	W Overlay	0.000	kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	TxDOT 2010
(Allowable compression stress factor at release = 0.65)	



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN						<div>17' Spd @ 2"</div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 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@ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @ 2"</div></div> <div>13 1/2\"/></div> <div><div>17' Spd @</div></div>	
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STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) f _{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f' _{ci} (ksi)				MINIMUM 28 DAY COMP. STRENGTH f' _c (ksi)	2	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, as H(NPC) if shown must be Grade 60, has the option of a strand girder or design submittals stored

longer must have greater than that

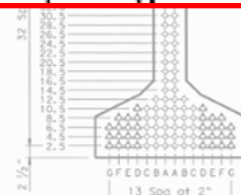
s have been percent. Optional

strands must be system unless a full row "2.5", using each row all the required in the "A" e 2" spacing so strands are in the row relaxation each. 05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand -length debonded row. Full-length F.4.

TING



TYPE Tx62 & Tx70



Nicholas Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdet.dgn	Rev: JBR	Rev: TJO	Rev: JBR	Rev: TJO
10/01/01	June 2007	10/01/01	June 2007	10/01/01
10/01/01	June 2007	10/01/01	June 2007	10/01/01
10/01/01	June 2007	10/01/01	June 2007	10/01/01



General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text" value="60"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text" value="0.656"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text" value="0.767"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text" value="1.829"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text" value="-1.948"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text" value="4110"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text" value="60"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text" value="0.656"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text" value="0.767"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text" value="1.829"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text" value="-1.948"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text" value="4110"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





General Information

Bridge	<input type="text" value="NB Direct Connector"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text" value="2552-03-034"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text" value="7"/>	Span Length (CL Bearings)	<input type="text" value="74.777"/> ft	Relative Humidity	<input type="text" value="60"/> %
Beam No.	<input type="text" value="1-4"/>	Beam Spacing	<input type="text" value="7.333"/> ft	LLDF (Moment)	<input type="text" value="0.656"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text" value="8.5"/> in	LLDF (Shear)	<input type="text" value="0.767"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
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Design Data

*ft, Design Compressive Stress, Top CL	<input type="text" value="1.829"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text" value="-1.948"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text" value="4110"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
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Project Criteria

Select Project Criteria Library Entry that Check is to be Based On	<input type="text" value="TxDOT 2010"/>
(Allowable compression stress factor at release = 0.65)	





Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci KSIf'c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci KSIf'c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci KSIf'c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci KSIf'c KSI

Standard Strand Layout

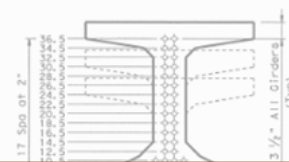
No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN						<div><div>17' 500 @ 2"</div><div>13 1/2" All Girders (Type)</div></div>	NON-STANDARD STRAND PATTERNS	
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMPRESSION STRESS (TOP) (ksi)	DESIGN LOAD TENSION STRESS (BOTTOM) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (SERVICE I) (SERVICE II) (FF-NI) (ksi)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT E OF GIRDER				
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)	DEPRESSED NO.	TO (in)							RELEASE STRENGTH (ksi)		MINIMUM 28 DAY COMP STRENGTH (ksi)	
																					① (ksi)
	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634			
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634			



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMP STRESS (TOP) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM) (SERVICE III) f _{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIPS) (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"e" (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (I) f' _{ci} (ksi)				MINIMUM 28 DAY COMP STRENGTH f' _c (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, Class III (HRPC) if shown, must be Grade 60. has the option of a strand girder or design submittals stored

longer must have greater than that

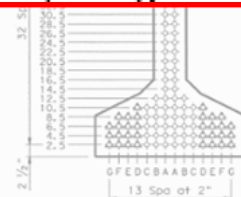
has been percent. Optional

strands must be system unless a full row "2.5", noting each row till the required in the "A" e 2" spacing so ronds are in the low relaxation each. .05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand 1-length depressed row. Full-length F.4.

ING



TYPE Tx62 & Tx70



Nicholas Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdetl.dgn	Rev: JBR	Rev: TxDOT	Rev: JBR	Rev: TxDOT
10/20/07	June 2007	10/20/07	June 2007	10/20/07
DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes
10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP
EL. 1050	EL. 1050	EL. 1050	EL. 1050	EL. 1050
2552	2552	2552	2552	2552
63	63	63	63	63
254	254	254	254	254
LP 375	LP 375	LP 375	LP 375	LP 375



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▼

Strand Type Grade 270, Low Relaxation ▼

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▼

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▼

Strand Type Grade 270, Low Relaxation ▼

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▼

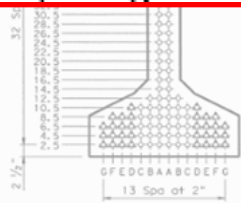
(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

17 Spd at 2"

3 1/2" All Girders (Typ)

DISCLAIMER:

STATE OF TEXAS
NICHOLAS NEMEC
102288
LICENSED
PROFESSIONAL ENGINEER

Nicholas Nemece
3/24/2011

 **Texas Department of Transportation**
Bridge Division

**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File#	19ndstel.dgn	Em: JER	En: T001	Em: JER	En: T001
① T001	June 2007	DISTRICT	FEDERAL AID PROJECT		
REVISIONS		ELP	44		
02/06	General Notes		COUNTY	CONTROL	SECT JOB
10/09	General Notes				
12/10	Red String & L&P		EL PASO	2552	03 034 LP

TYPE Tx62 & Tx70⁽³⁾

Revised 03-23-11



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

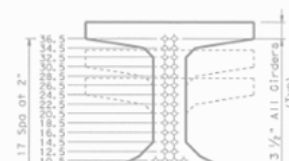
No. Strands 0 ▾

(No. Depressed strands = 0)

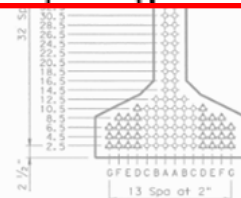
Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN						NON-STANDARD STRAND PATTERNS				
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) (ft-ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) (ft-ksi)	REQUIRED MINIMUM ULTIMATE CAPACITY (ft-klips)	LIVE LOAD DISTRIBUTION FACTOR			PATTERN	STRAND ARRANGEMENT AT ϵ OF GIRDER			
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED NO.	TO (in)				RELEASE STRENGTH (1) (ft-ksi)					MINIMUM 28 DAY COMP. STRENGTH (ft-ksi)	1	2
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	(4)	A(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) B(2.5, 4.5, 6.5, 8.5, 10.5, 12.5) C(2.5, 4.5, 6.5, 8.5, 10.5) D(2.5, 4.5, 6.5, 8.5, 10.5) E(2.5, 4.5)		
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	(5)	A(2.5, 4.5, 6.5, 8.5, 10.5)		



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f_{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) f_{cb} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f_{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f'_{ci} (ksi)				MINIMUM 28 DAY COMP. STRENGTH f'_{c} (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767	



TYPE Tx62 & Tx70



Nicholas Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdetl.dgn	Rev: JBR	Rev: TxDOT	Rev: JBR	Rev: TxDOT
TxDOT June 2007	DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS	ELP	446		
02/05b General Notes.				
10/05b General Notes.				
12/05b Neil Serghs & LLOP.				
	COUNTY	CONTROL	SECT	JOB
	EL PASO	2552	03	034 LP 30



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

 f'_{ci} 4 KSI f'_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

 f'_{ci} KSI f'_c KSI


Standard Strand Layout

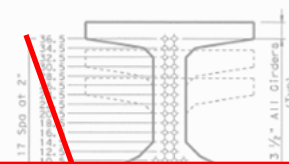
No. Strands 0 ▾

(No. Depressed strands = 0)

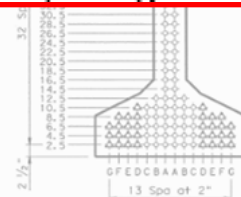
Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN						NON-STANDARD STRAND PATTERNS		
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS			CONCRETE		DESIGN LOAD COMB. STRESS (TOP) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOT) (SERVICE II)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (SERVICE I)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT % OF GIRDER				
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)								DEPRESSED NO.	TO (in)	RELEASE STRENGTH (1) (ksi)
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528 0.634	(4)	A (2.5, 4.5, 6.5, 8.5, 10.5, 12.5) B (2.5, 4.5, 6.5, 8.5, 10.5, 12.5) C (2.5, 4.5, 6.5, 8.5, 10.5, 12.5) D (2.5, 4.5, 6.5, 8.5, 10.5) E (2.5, 4.5)
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528 0.634	(5)	A (2.5, 4.5, 6.5, 8.5, 10.5)



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN			
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOT) (SERVICE II)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (SERVICE I)	LIVE LOAD DISTRIBUTION FACTOR	
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)	DEPRESSED NO.	TO (in)	RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP. STRENGTH (2) (ksi)			
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639 0.528 0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443 0.528 0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752 0.591 0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110 0.656 0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200 0.688 0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367 0.688 0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954 0.588 0.767



TYPE Tx62 & Tx70



Nicholas Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdetl.dgn	Rev: JBR	Rev: TxDOT	Rev: JBR	Rev: TxDOT
10/20/07	June 2007	10/20/07	June 2007	10/20/07
DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes
10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP	10/20/07: Del. Design & LOP
EL. 1050	EL. 1050	EL. 1050	EL. 1050	EL. 1050
2552	2552	2552	2552	2552
63	63	63	63	63
034	034	034	034	034
LP	LP	LP	LP	LP
375	375	375	375	375



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci 4 KSI

f'c 5 KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci KSIf'c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

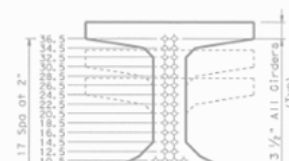


STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN				NON-STANDARD STRAND PATTERNS					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) (ksi)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE II) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (FT-KIP) (I) (ft-kips)			LIVE LOAD DISTRIBUTION FACTOR			
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED NO.	TO (in)						RELEASE STRESS (1) (ksi)	MINIMUM STRENGTH (c) (ksi)	1	2
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634		
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634		

17 Spd @ 2"

36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2

13 1/2" A-11 Girders (Typ)



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) (ksi)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE II) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (I)	LIVE LOAD DISTRIBUTION FACTOR (2)			
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED					RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP STRENGTH (ksi)	Moment	Shear
										NO.	TO (in)							
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, as H(NPC) if shown must be Grade 60, has the option of a strand girder or design submittals stored

longer must have greater than that

s have been percent. Optional

strands must be system unless a full row "2.5", using each row all the required in the "A" e 2" spacing so strands are in the row relaxation each. 05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand -length debonded row. Full-length F.4.

TING




 NICHOLAS NEMEC
 102288
 LICENSED
 3/24/2011

Texas Department of Transportation
 Bridge Division
**PRESTRESSED CONCRETE
 I-GIRDER DESIGNS
 (NON-STANDARD SPANS)**

IGND

File: Ignrdetl.dgn	Rev: JBR	Rev: TJO	Rev: JBR	Rev: TJO
10/20/07	June 2007	10/20/07	June 2007	10/20/07
DESIGNED BY: JBR	CHECKED BY: JBR	DESIGNED BY: JBR	CHECKED BY: JBR	DESIGNED BY: JBR
10/20/07	June 2007	10/20/07	June 2007	10/20/07

Revised 03-23-11

TYPE Tx62 & Tx70



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

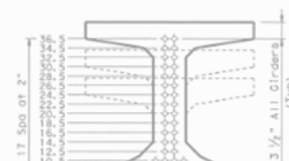
(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN						<div><div>17' 500 0" 2"</div><div>17' 500 0" 2"</div><div>13 1/2" A-11 Girders (Type)</div></div>		NON-STANDARD STRAND PATTERNS		
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II)	REQUIRED MINIMUM ULTIMATE CAPACITY (FT-KIP)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN			STRAND ARRANGEMENT AT ϵ OF GIRDER		
					TOTAL NO.	SIZE	STRENGTH	"a" ϵ	"e" END	DEPRESSED NO.	TO									RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP. STRENGTH (ksi)
1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	(4)	A(2, 5, 4, 5, 6, 5, 8, 5, 10, 5, 12, 5) B(2, 5, 4, 5, 6, 5, 8, 5, 10, 5, 12, 5) C(2, 5, 4, 5, 6, 5, 8, 5, 10, 5, 12, 5) D(2, 5, 4, 5, 6, 5, 8, 5, 10, 5, 12, 5) E(2, 5, 4, 5)		
2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	(5)	A(2, 5, 4, 5, 6, 5, 8, 5, 10, 5)		



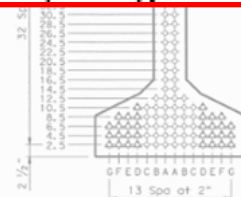
STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMB. STRESS (TOP ϵ) (SERVICE I) f _{ot} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM ϵ) (SERVICE II) f _{ob} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"a" ϵ (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f' _{ol} (ksi)				MINIMUM 28 DAY COMP. STRENGTH f' _c (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, Class (HRPC) if shown, must be Grade 60, has the option of design submittals stored longer than that have been recent. Optional strands must be system unless a full row "2.5", noting each row till the required in the "A" e 2" spacing so ronds are in the low relaxation each, .05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand 1-length depressed row. Full-length F.4.

ING



TYPE Tx62 & Tx70



Nicholas Ramez
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdet.dgn	Rev: JBR	Rev: TJO	Rev: JBR	Rev: TJO
10/01	June 2007	10/01	June 2007	10/01
DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes	DESIGN: General Notes
10/01: See Section 1100	10/01: See Section 1100	10/01: See Section 1100	10/01: See Section 1100	10/01: See Section 1100
EL. 1050	2552	63	634	LP 375



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Prestress Eccentricity

e, CL = 20.281 in
e, girder ends = 19.190 in

OK

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand

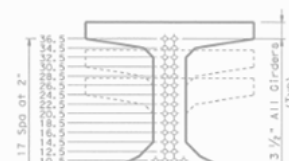
No. Strands

(No. Depressed strands = 0)

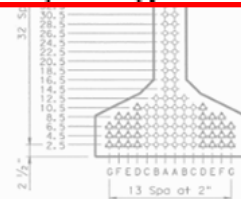
Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN				NON-STANDARD STRAND PATTERNS	
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMPRESSION STRESS (TOP) (ksi)	DESIGN LOAD TENSION STRESS (BOTTOM) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT E OF GIRDER
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)	DEPRESSED NO.	TO (in)	RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP STRENGTH (2) (ksi)				
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.100	4.549	-4.394	6639	0.528 0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528 0.634



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)											OPTIONAL DESIGN				NON-STANDARD STRAND PATTERNS	
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD COMPRESSION STRESS (TOP) (ksi)	DESIGN LOAD TENSION STRESS (BOTTOM) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips)	LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT E OF GIRDER
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)	DEPRESSED NO.	TO (in)	RELEASE STRENGTH (1) (ksi)	MINIMUM 28 DAY COMP STRENGTH (2) (ksi)				
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528 0.634
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528 0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591 0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656 0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688 0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688 0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588 0.767



TYPE Tx62 & Tx70



Nicholas Nemecek
3/24/2011

Texas Department of Transportation
Bridge Division
**PRESTRESSED CONCRETE
I-GIRDER DESIGNS
(NON-STANDARD SPANS)**

IGND

File: Ignrdet.dgn	Rev: 001	Rev: 001	Rev: 001	Rev: 001
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01
01/01/01	June 2007	01/01/01	June 2007	01/01/01



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Prestress Eccentricity

e, CL = 20.281 in
e, girder ends = 19.190 in

OK

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand

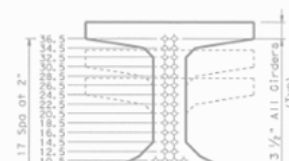
No. Strands

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity

STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)										OPTIONAL DESIGN					NON-STANDARD STRAND PATTERNS				
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS					CONCRETE		DESIGN LOAD TENSILE STRESS (TOP) (ksi)	DESIGN LOAD TENSILE STRESS (BOT) (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips)		LIVE LOAD DISTRIBUTION FACTOR	PATTERN	STRAND ARRANGEMENT AT % OF GIRDER		
					TOTAL NO.	SIZE (in)	STRENGTH (ksi)	"e" (in)	"e" END (in)	DEPRESSED NO.	TO (in)								RELEASE STRENGTH (ksi)	MINIMUM 28 DAY COMP STRENGTH (ksi)
					(in)	(ksi)	(in)	(in)			(in)									
	1	ALL	Tx46	(4)	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634	(4)	A (2, 5, 4, 5, 6, 5, 8, 5, 10, 5, 12, 5) B (2, 5, 4, 5, 6, 5, 8, 5, 10, 5, 12, 5) C (2, 5, 4, 5, 6, 5, 8, 5, 10, 5) D (2, 5, 4, 5, 6, 5, 8, 5, 10, 5) E (2, 5, 4, 5)
	2	ALL	Tx46	(5)	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634	(5)	A (2, 5, 4, 5, 6, 5, 8, 5, 10, 5)



STRUCTURE	DESIGNED GIRDERS (DEPRESSED STRANDS)												OPTIONAL DESIGN					
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STANDARD STRAND PATTERN	PRESTRESSING STRANDS						CONCRETE		DESIGN LOAD COMPRESSIVE STRESS (TOP) (SERVICE I) f _{ci} (ksi)	DESIGN LOAD TENSILE STRESS (BOTTOM) (SERVICE III) f _{cb} (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (ft-kips) (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR		
					TOTAL NO.	SIZE (in)	STRENGTH f _{pu} (ksi)	"e" (in)	"e" END (in)	DEPRESSED		RELEASE STRENGTH (1) f' _{ci} (ksi)				MINIMUM 28 DAY COMP STRENGTH f' _c (ksi)	②	
										NO.	TO (in)						Moment	Shear
NORTHBOUND DIRECT CONNECTOR	1	ALL	Tx46	④	48	0.6	270	13.35	5.85	12	42.5	5.600	7.400	4.549	-4.394	6639	0.528	0.634
	2	ALL	Tx46	⑤	44	0.6	270	13.88	6.60	10	42.5	5.400	7.100	4.399	-4.255	6443	0.528	0.634
	3-6 & 16-20	ALL	Tx54		60	1/2	270	17.61	10.94	10	50.5	5.400	6.100	3.906	-3.944	7752	0.591	0.767
	7-8 & 12-13	ALL	Tx54		22	1/2	270	20.28	19.19	4	10.5	4.000	5.000	1.829	-1.948	4110	0.656	0.767
	14	ALL	Tx54		30	1/2	270	19.81	17.41	6	18.5	4.000	5.000	2.345	-2.479	5200	0.688	0.767
	15	ALL	Tx54		66	1/2	270	17.07	10.52	12	48.5	5.800	6.400	4.008	-4.128	8367	0.688	0.767
	21	ALL	Tx54		62	1/2	270	17.46	11.01	10	50.5	5.600	6.300	4.026	-4.058	7954	0.588	0.767

Specifications, as H(NPC) if shown must be Grade 60, has the option of a strand girder or design submittals stored

longer must have greater than that

s have been percent. Optional


strands must be system unless a full row "2.5", using each row all the required in the "A" e 2" spacing so strands are in the row relaxation each. 05" in width as is permitted providing the 1" clear approved .005" form

uses (ksi):

permitted in strand -length debonded row. Full-length F,4.

TING




 NICHOLAS NEMEC
 102288
 LICENSED
 3/24/2011

Texas Department of Transportation
 Bridge Division
**PRESTRESSED CONCRETE
 I-GIRDER DESIGNS
 (NON-STANDARD SPANS)**

IGND	FILE: Igrndtbl.dgn	REV: JRM	REV: TJO	REV: JRM	REV: TJO
DATE: June 2007	DATE: June 2007	DATE: June 2007	DATE: June 2007	DATE: June 2007	DATE: June 2007
BY: JRM	BY: JRM	BY: JRM	BY: JRM	BY: JRM	BY: JRM
CHECKED: JRM	CHECKED: JRM	CHECKED: JRM	CHECKED: JRM	CHECKED: JRM	CHECKED: JRM
APPROVED: JRM	APPROVED: JRM	APPROVED: JRM	APPROVED: JRM	APPROVED: JRM	APPROVED: JRM
EL PASO	EL PASO	EL PASO	EL PASO	EL PASO	EL PASO
2552	2552	2552	2552	2552	2552
63	63	63	63	63	63
034	034	034	034	034	034
LP 375	LP 375	LP 375	LP 375	LP 375	LP 375

TYPE Tx62 & Tx70

Revised 03-23-11



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Prestress Eccentricity

e, CL = 20.281 in
e, girder ends = 19.190 in

OK

Fabricator Optional Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand

No. Strands

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

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No. Strands 22 ▾

(No. Depressed strands = 4)

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Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Standard Strand Layout

No. Strands 0 ▾

(No. Depressed strands = 0)

Girder Bottom to
Topmost Strand (To) in

Compute Eccentricity



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

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Topmost Strand (To) 10.5 in

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Fabricator Optional Girder Design

☐ Standard Strand Fill

☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	0
2	4.500	0
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
1	22.500	0

No. Strands = 0

Strand Rows - Girder Ends

	Row (in)	No. Strands
1	2.500	0
2	4.500	0
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
1	22.500	0

No. Strands = 0



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

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(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☐ Standard Strand Fill☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} KSIf_c KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	0
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3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
1	22.500	0

No. Strands = 0

Strand Rows - Girder Ends

	Row (in)	No. Strands
1	2.500	0
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5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
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No. Strands = 0



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

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☒ Use Depressed Strands

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f_{ci} KSIf_c KSI

Strand Rows - Girder Centerline

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1	20.500	0
1	22.500	0

No. Strands = 0

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1	20.500	0
1	22.500	0

No. Strands = 0



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

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(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

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Fabricator Optional Girder Design

☐ Standard Strand Fill☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

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Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	0
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5	10.500	0
6	12.500	0
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8	16.500	0
9	18.500	0
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1	22.500	0

No. Strands = 0



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

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Fabricator Optional Girder Design

☐ Standard Strand Fill☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
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1	22.500	0

No. Strands = 0

Strand Rows - Girder Ends

	Row (in)	No. Strands
1	2.500	0
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4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
1	22.500	0

No. Strands = 0



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci 4 KSI

f'c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

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☐ Standard Strand Fill

☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f'ci 4 KSI

f'c 5 KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	0
2	4.500	0
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4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
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1	20.500	0
1	22.500	0

No. Strands = 0

Strand Rows - Girder Ends

	Row (in)	No. Strands
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6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
1	22.500	0

No. Strands = 0



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

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Fabricator Optional Girder Design

☐ Standard Strand Fill☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2
1	20.500	0
1	22.500	0

No. Strands = 30
e = 17.408 in

Strand Rows - Girder Ends

	Row (in)	No. Strands
1	2.500	0
2	4.500	0
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	0
8	16.500	0
9	18.500	0
1	20.500	0
1	22.500	0

No. Strands = 0





Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☐ Standard Strand Fill☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2
1	20.500	0
1	22.500	0

No. Strands = 30
e = 17.408 in

Strand Rows - Girder Ends

	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2 ▾
1	20.500	0
1	22.500	0

No. Strands = 30
e = 17.408 in



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

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Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☐ Standard Strand Fill☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2
1	20.500	0
1	22.500	0

No. Strands = 30
e = 17.408 in

Strand Rows - Girder Ends

	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2
1	20.500	0
1	22.500	0

No. Strands = 30
e = 17.408 in



Original Girder Design

☒ Standard Strand Fill

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Standard Strand Layout

No. Strands 22 ▾

(No. Depressed strands = 4)

Girder Bottom to
Topmost Strand (To) 10.5 in

(Valid Range: 4.500 to 50.500)

Compute Eccentricity

Fabricator Optional Girder Design

☐ Standard Strand Fill

☒ Use Depressed Strands

Strand Size 1/2" ▾

Strand Type Grade 270, Low Relaxation ▾

f_{ci} 4 KSIf_c 5 KSI

Strand Rows - Girder Centerline

	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2
1	20.500	0
1	22.500	0

 No. Strands = 30
 e = 17.408 in

Strand Rows - Girder Ends

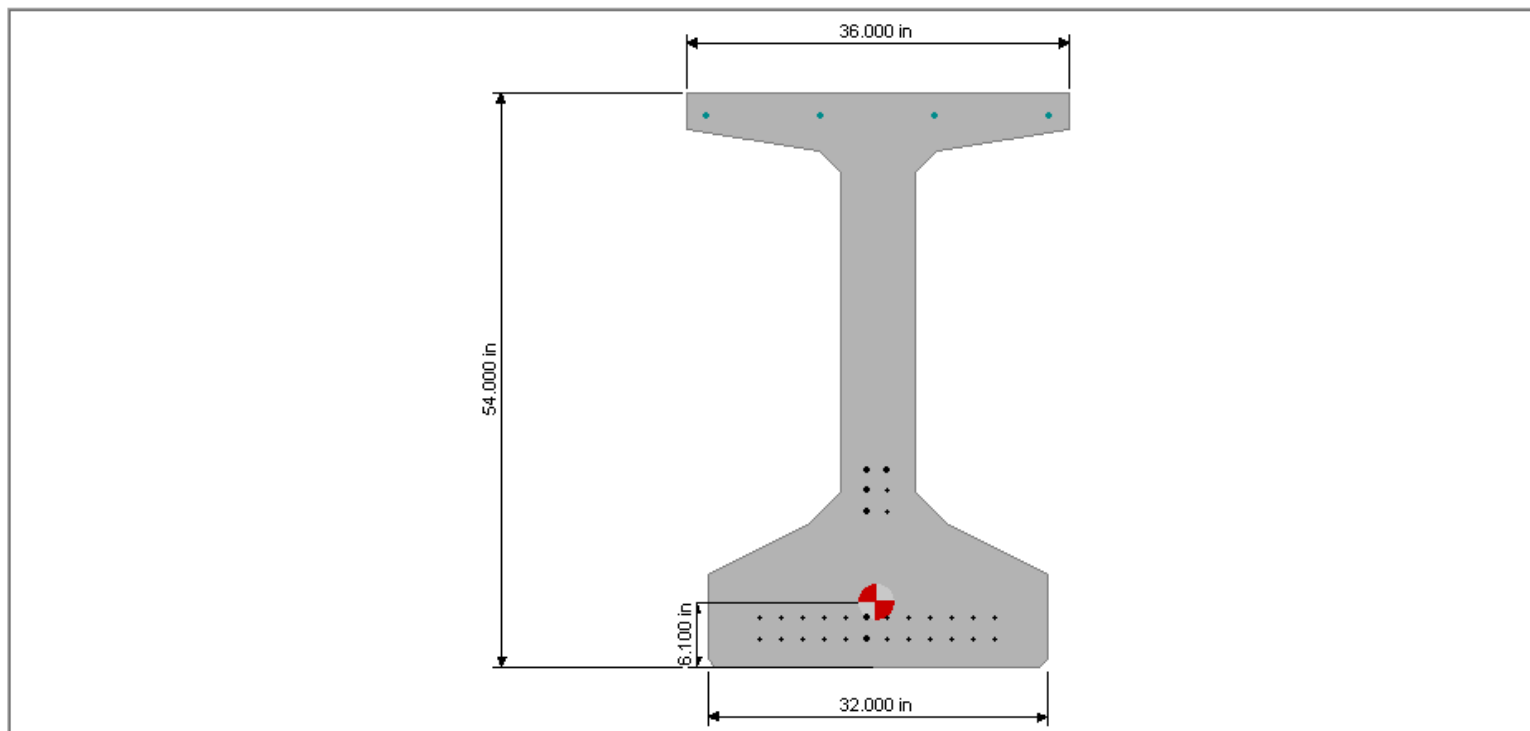
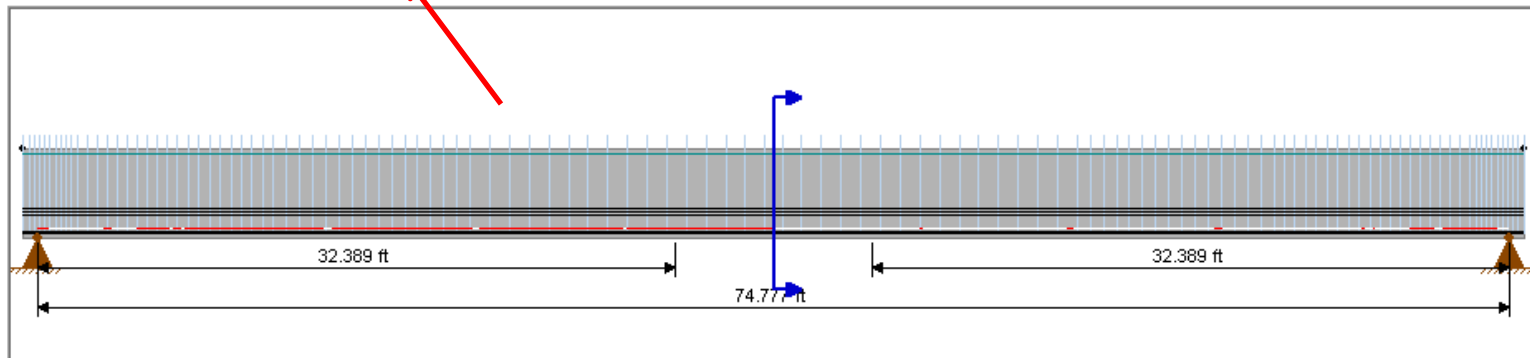
	Row (in)	No. Strands
1	2.500	12
2	4.500	12
3	6.500	0
4	8.500	0
5	10.500	0
6	12.500	0
7	14.500	2
8	16.500	2
9	18.500	2 ▾
1	20.500	0
1	22.500	0

 No. Strands = 30
 e = 17.408 in



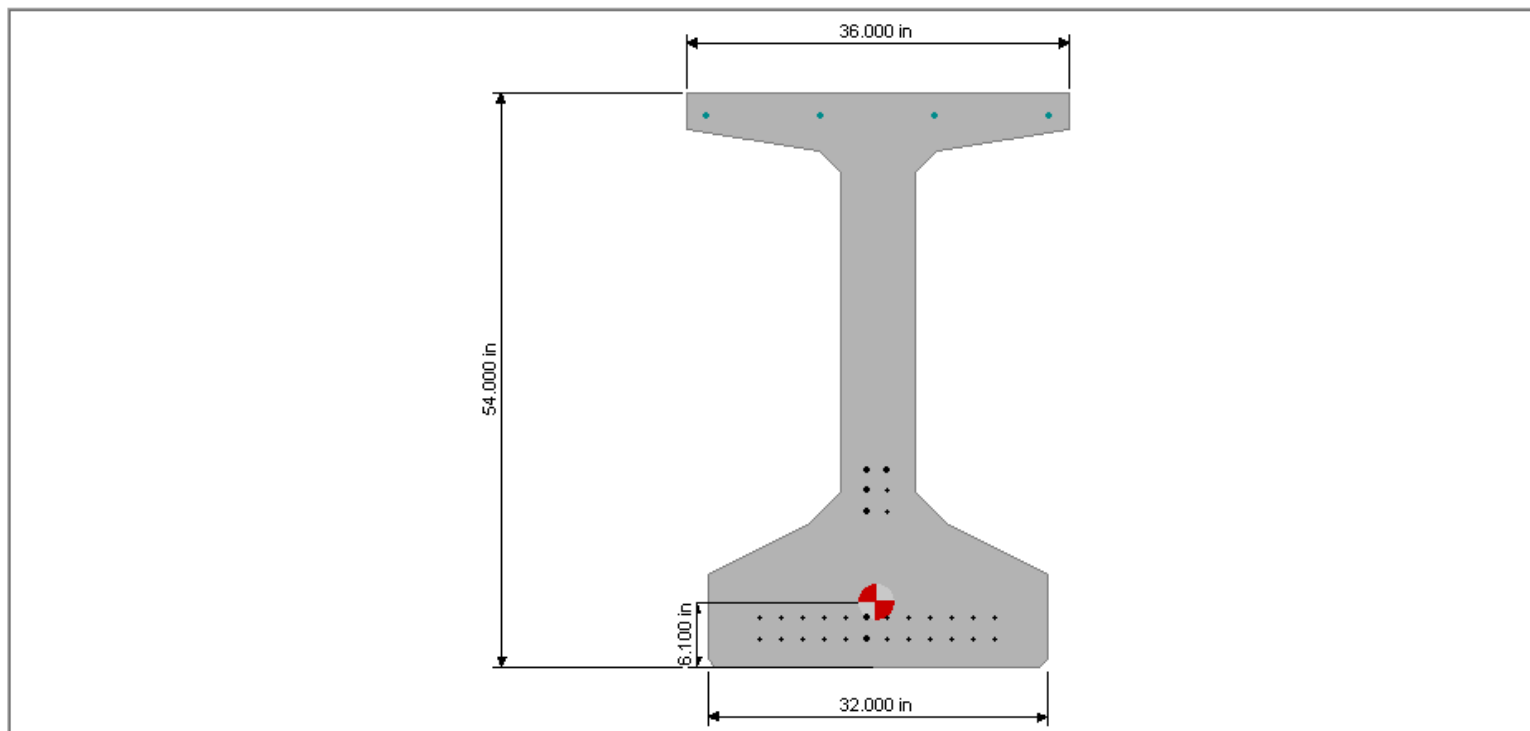
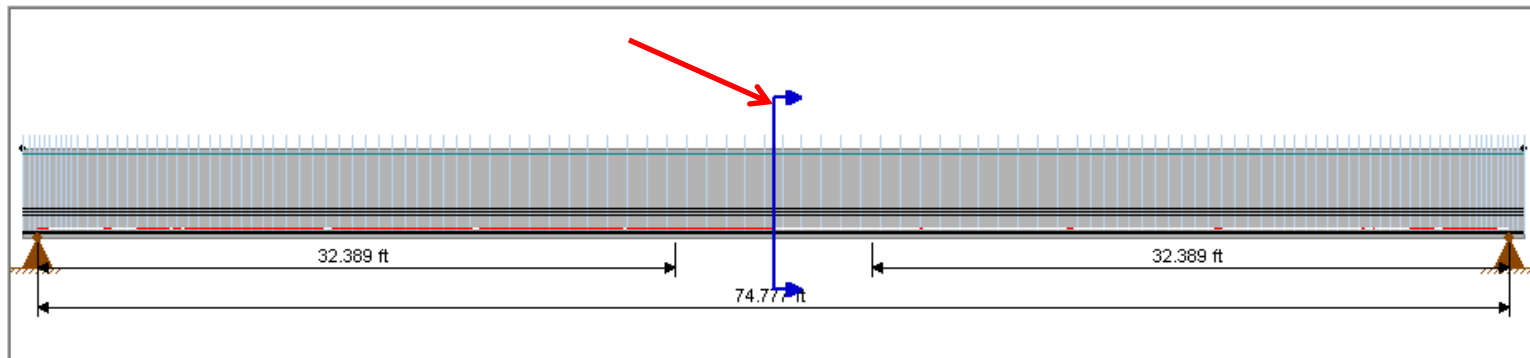
Select Girder: Fabricator Optional Design

Section Cut Offset: 38.139 ft



Select Girder: Fabricator Optional Design

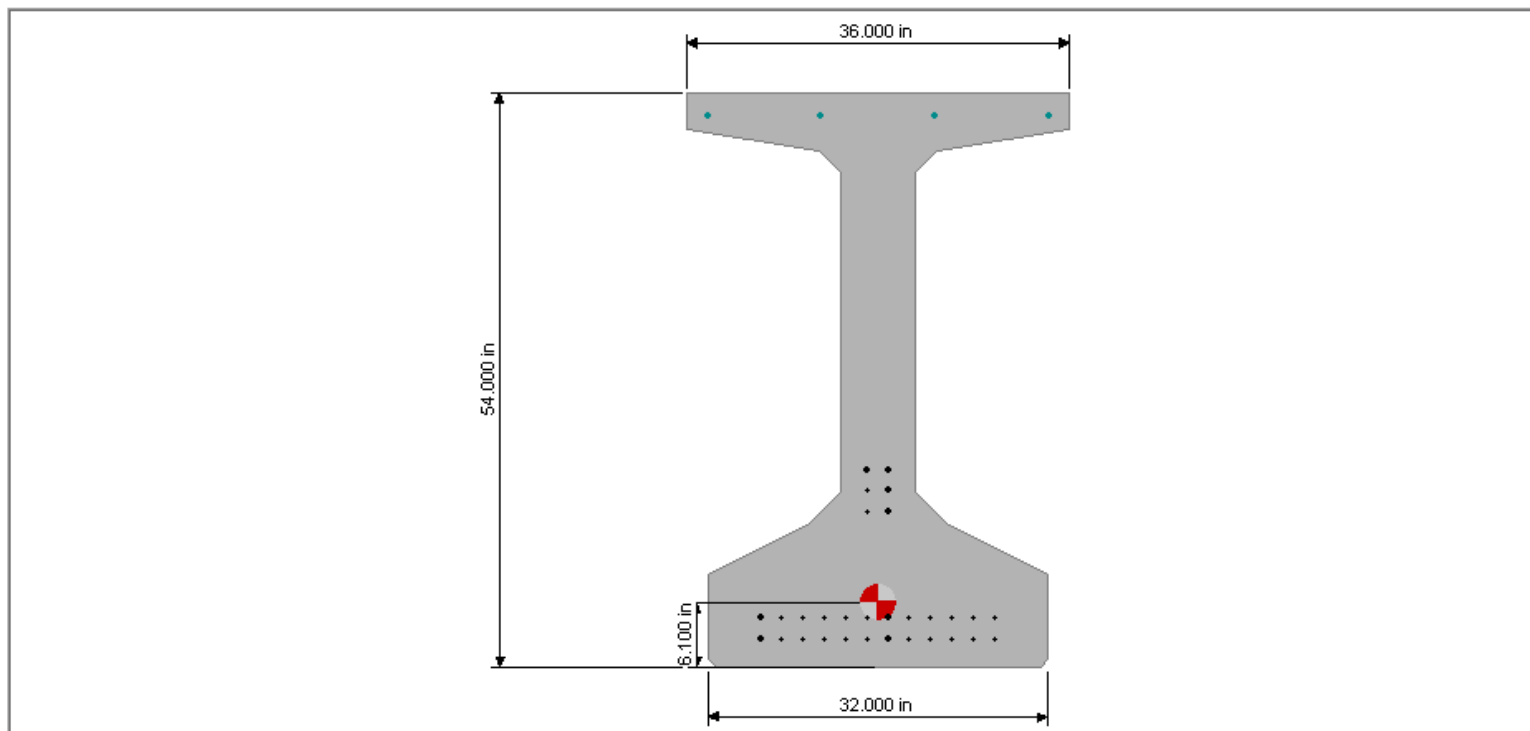
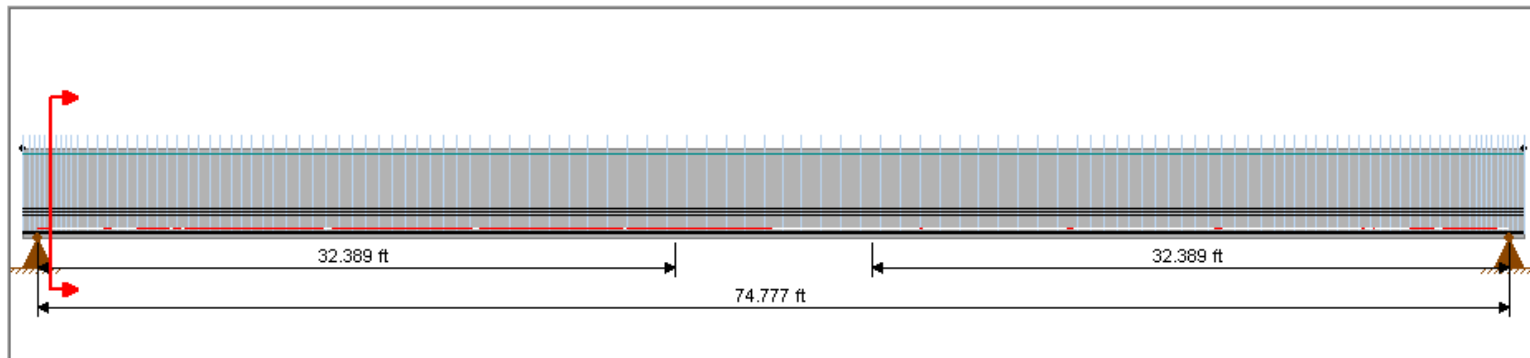
Section Cut Offset: 38.139 ft





Select Girder: Fabricator Optional Design

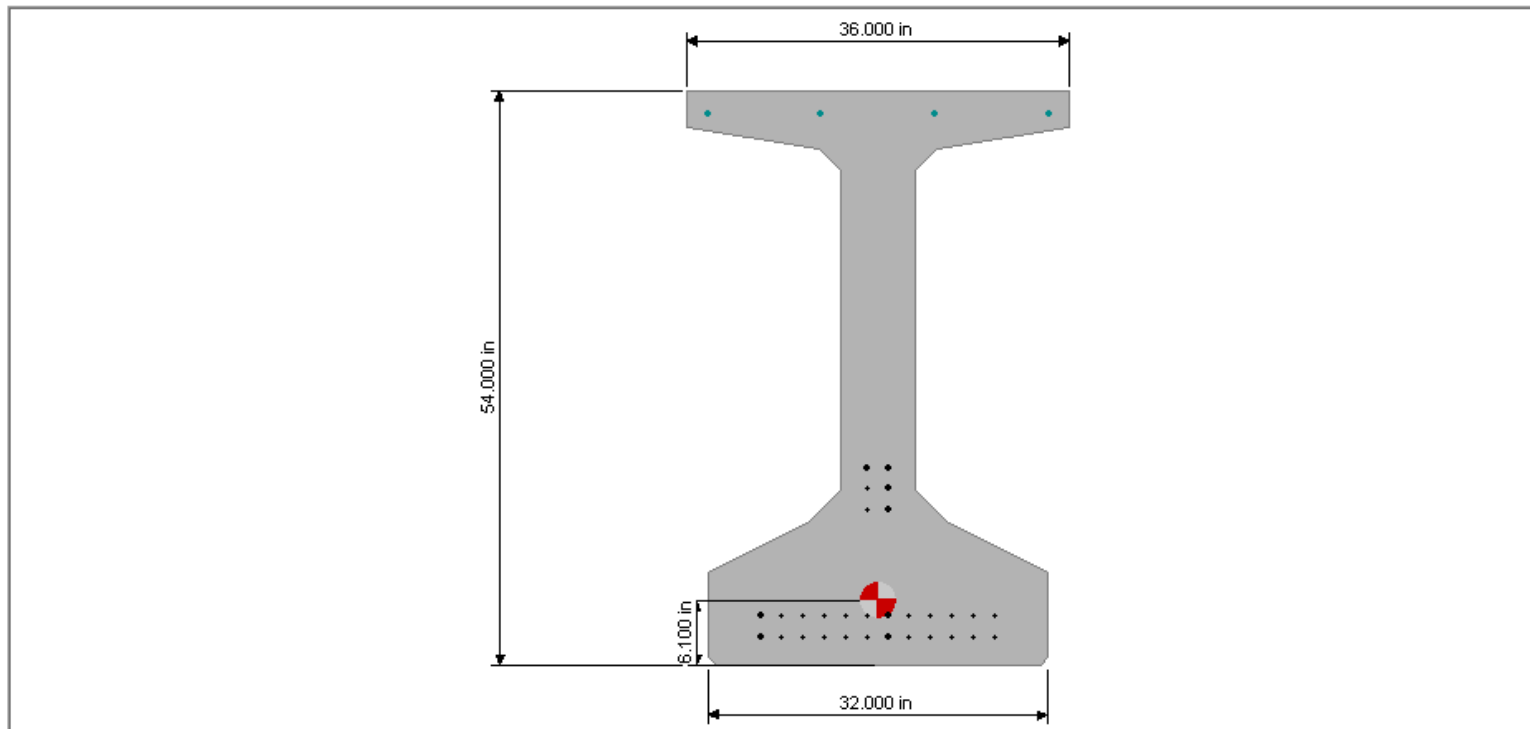
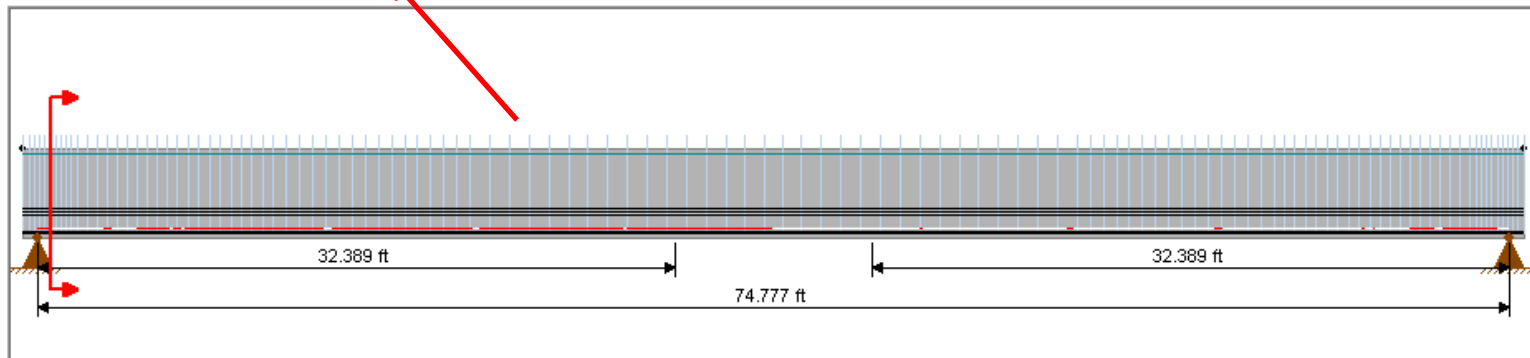
Section Cut Offset: 1.356 ft





Select Girder: Fabricator Optional Design

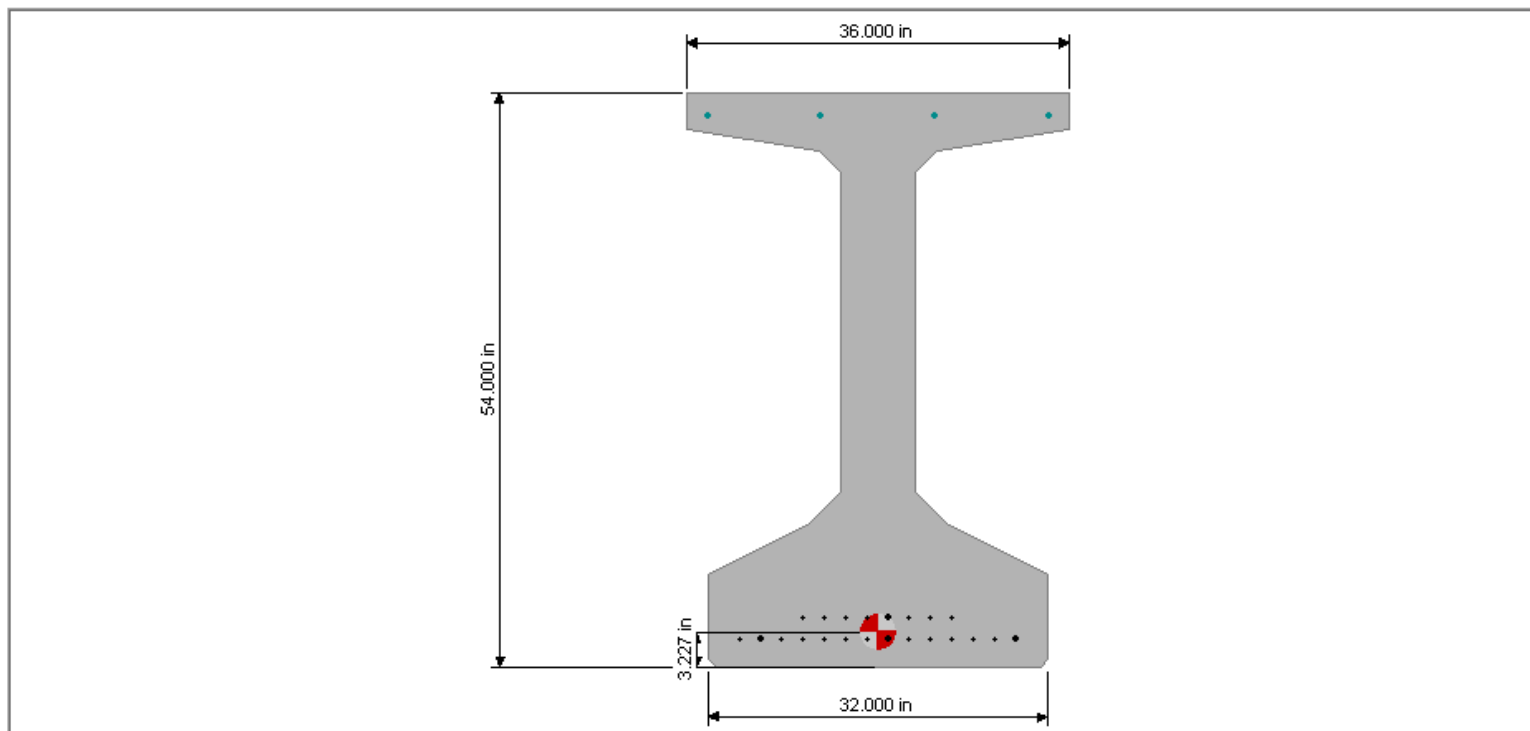
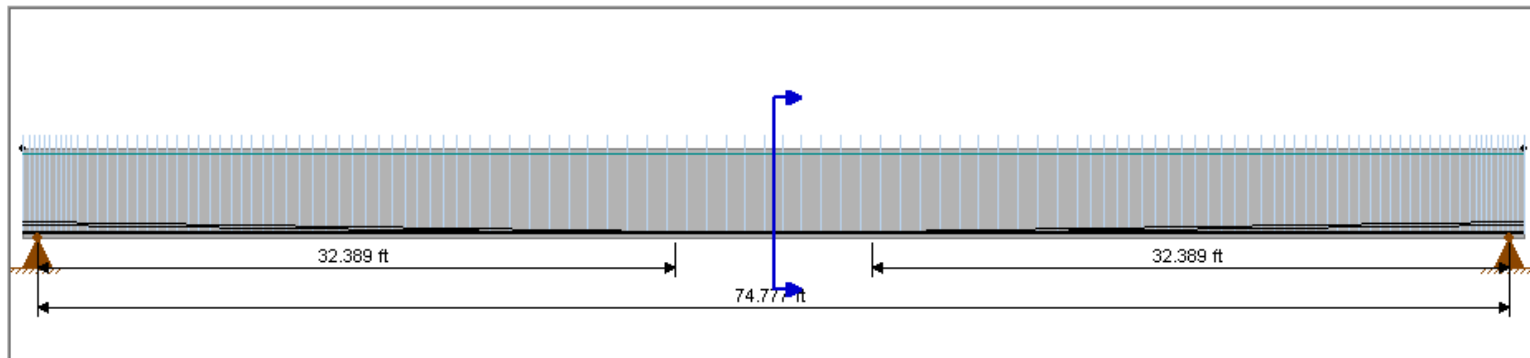
Section Cut Offset: 1.356 ft





Select Girder: Original Design

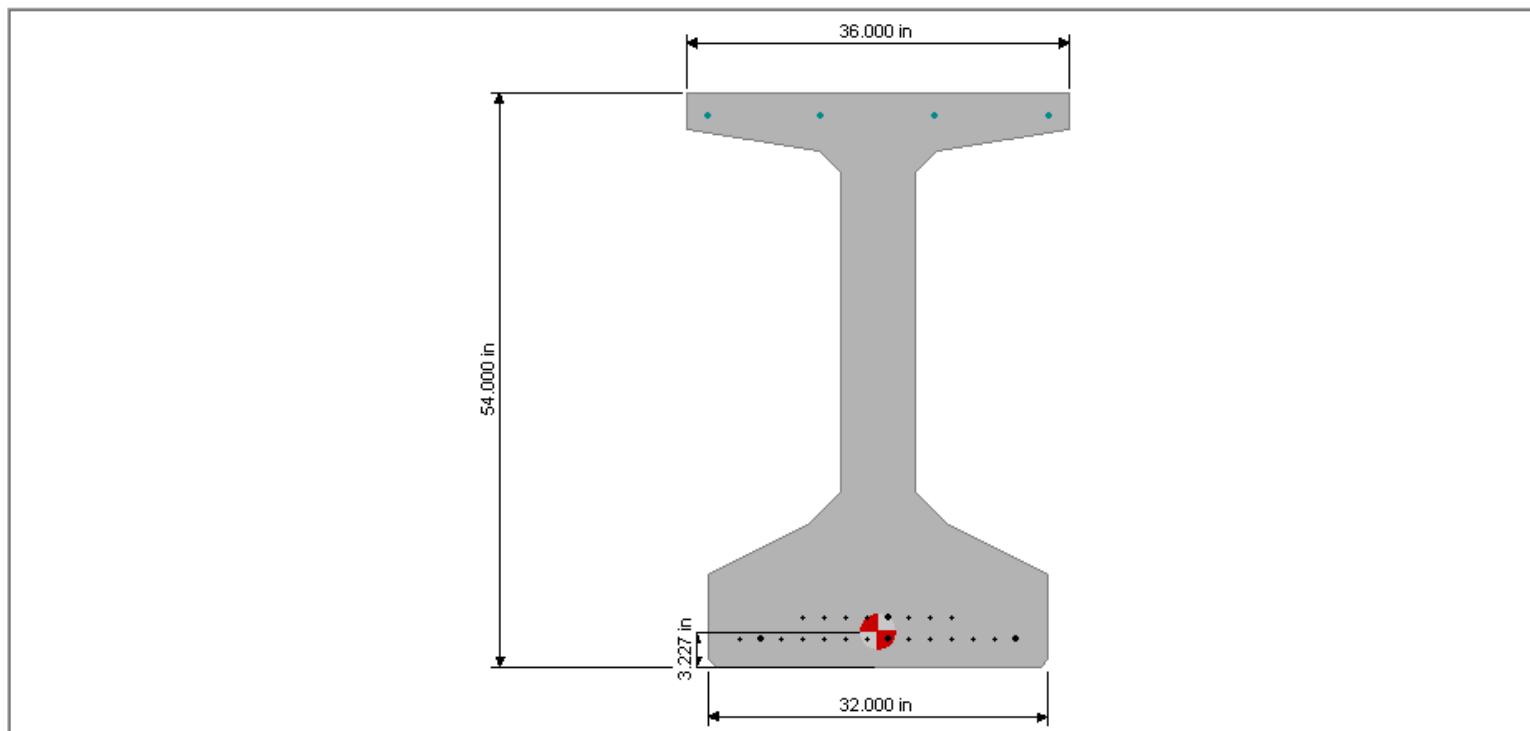
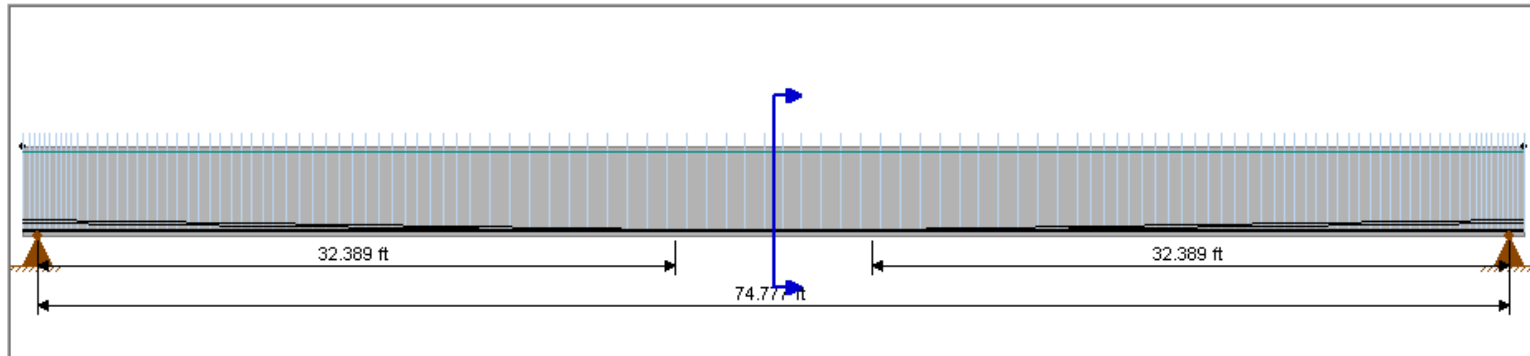
Section Cut Offset: 38.139 ft





Select Girder: Original Design

Section Cut Offset: 38.139 ft





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Version 2.5.1 - Built on Aug 17 2011



TEXAS DEPARTMENT OF TRANSPORTATION

Project Properties

Bridge Name	NB Direct Connector
Bridge ID	
Job Number	2552-03-034
Engineer	T Retterer
Company	TxDOT
Comments	
File	

Library Usage

Master Library Publisher: TxDOT

Library and Template Package URL: ftp://ftp.dot.state.tx.us/pub/txdot-info/brg/pgsuper/version_2.5.1/txdot.pgz

Master Library Date Stamp: September 28, 2011 10:48:10 am

Status Items

Level	Description
Info	Live Load Distribution Factors were User-Input.

Specification Check Summary

The Specification Check was Successful

Optional Design Summary



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Optional Design Summary

Design Information

Span No.	7
Beam No.	1-4
Beam Type	Tx54
Span Length (CL Bearings)	74.777 ft
Beam Spacing	7.333 ft
Slab Thickness	8.500 in
Relative Humidity	60%
LLDF (Moment)	0.656
LLDF (Shear)	0.767
E_c Slab	5000 KSI
E_c Beam	5000 KSI
f_c Slab	4.000 KSI
Project Criteria	TxDOT 2010
Live Load	HL-93

Design Data

f_r Design Load Compressive Stress, Top CL	1.829 KSI
f_b Design Load Tensile Stress, Bottom CL	-1.948 KSI
M_u Required Ultimate Moment Capacity	4110.00 kip-ft
$W_{non-comp DC}$	0.000 kip/ft
$W_{comp DC}$	0.000 kip/ft
$W_{Overlay}$	0.000 kip/ft
Allowable Compressive Stress Factor at Release	$0.65f_{ci}$

Note: Values in the above table reflect the following sign convention: Compressive stress is positive. Tensile stress is negative.

Original Girder Design





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Note: Values in the above table reflect the following sign convention: Compressive stress is positive. Tensile stress is negative.

Original Girder Design

f_{ci}	4.000 KSI
f_c	5.000 KSI
Prestressing Strands	1/2", Grade 270, Low Relaxation
No. Strands	22 (standard fill used)
Girder Bottom to Topmost Strand (To)	10.500 in
e_{CL}	20.281 in
$e_{girder\ ends}$	19.190 in

Fabricator Optional Girder Design

f_{ci}	4.000 KSI
f_c	5.000 KSI
Prestressing Strands	1/2", Grade 270, Low Relaxation
No. Strands	30 (non-standard fill, with depressed strands)
e_{CL}	17.408 in
$e_{girder\ ends}$	17.408 in

Non-Standard Strand Pattern at Girder Centerline

Row (in)	2.500	4.500	14.500	16.500	18.500
No. Strands	12	12	2	2	2

Non-Standard Strand Pattern at Girder Ends

Row (in)	2.500	4.500	14.500	16.500	18.500
No. Strands	12	12	2	2	2





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Non-Standard Strand Pattern at Girder Ends

Row (in)	2.500	4.500	14.500	16.500	18.500
No. Strands	12	12	2	2	2

Input Design Data Vs. Calculated Design Data

Value	Input Design Data	Calculated Design Data	Input/Calculated Ratio	Status
Design Load Compressive Stress, Top CL (KSI)	1.829	1.654	1.10571	Ok
Design Load Tensile Stress, Bottom CL (KSI)	-1.948	-1.680	1.15957	Ok
Required Ultimate Moment (kip-ft)	4110.00	3565.68	1.15266	Ok

Note: Values in the above table reflect the following sign convention: Compressive stress is positive. Tensile stress is negative.

Analysis of Fabricator Optional Design

Value	Input Design Data	Analysis of Fabricator Optional Design	Input/Analysis Ratio	Status
Required f_{ci} (KSI)	4.000	4.000	1	Ok
Required f_c (KSI)	5.000	5.000	1	Ok
Ultimate Moment Capacity (kip-ft)	4110.00	5638.51	0.728915	Ok

Camber Analysis

Value	Analysis of Original Design	Analysis of Fabricator Optional Design	Difference	Status
Maximum Camber (ft)	0.133	0.175	0.042	Design Deficiency

Note: Upward Camber is positive

Shear Design Check

Standard shear reinforcing pattern: Ok





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Version 2.5.1 - Built on Aug 17 2011



TEXAS DEPARTMENT OF TRANSPORTATION

Project Properties

Bridge Name	NB Direct Connector
Bridge ID	
Job Number	2552-03-034
Engineer	T Retterer
Company	TxDOT
Comments	
File	

Library Usage

Master Library Publisher: TxDOT

Library and Template Package URL: ftp://ftp.dot.state.tx.us/pub/txdot-info/brg/pgsuper/version_2.5.1/txdot.pgz

Master Library Date Stamp: September 28, 2011 10:48:10 am

Status Items

Level	Description
Info	Live Load Distribution Factors were User-Input.

Specification Check Summary

The Specification Check was Successful

Optional Design Summary



Show: Long Report

	Original Design	Fabricator Optional Design		
Maximum Camber (ft)	0.133	0.175	0.042	Design Deficiency

Note: Upward Camber is positive

Shear Design CheckStandard shear reinforcing pattern: **Ok****Beginning of Long Section of Report***Note: Unless otherwise specified, all results output from this point on reflect values from the Precaster Optional Design.***Section Properties****Section Properties**

	Girder	Composite
Area (in ²)	817.312	1565.278
I _x (in ⁴)	299739.7	775644.6
I _y (in ⁴)	46706.8	529350.3
d (girder depth) (in)	54.000	62.500
Y _{t girder} (in)	30.492	13.891
Y _{t slab} (in)	-	22.391
Y _b (in)	23.508	40.109
k _t (in) (Top kern point)	15.601	-
k _b (in) (Bottom kern point)	12.027	-
S _{t girder} (in ³)	9830.1	55839.3
S _b (in ³)	12750.6	19338.2
S _{t slab} = n(I _x /Y _{t slab}) (in ³)	-	34641.5
Q _{slab} (in ³)	-	13568.6



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Loading Details

Uniform Loads Applied Along the Entire Girder

Load Type	w (kip/ft)
Girder	0.851

Slab Load Applied Between Bearings

Slab Load is uniform along entire girder length.

Load Type	w (kip/ft)
Total Slab Weight	0.779

Overlay

Overlay load is uniform along entire girder length.

Load Type	w (kip/ft)
Overlay Weight	0.000

Overlay load is distributed using tributary width.

User Defined Loads

Locations are measured from left support.

Distributed Loads

Stage	Load Case	Start Location (ft)	End Location (ft)	Start Magnitude (kip/ft)	End Magnitude (kip/ft)	Description
Bridge Site 1	DC	0.000	74.777	0.000	0.000	w non-comp, dc
Bridge Site 2	DC	0.000	74.777	0.000	0.000	w comp, dc



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Bridge Site 2 DC 0.000 74.777 0.000 0.000 w comp, dc

Prestress Force and Strand Stresses

Strand Stress at Various Stages of Prestress Loss at Girder Mid-point

Loss Stage	Permanent Strand			
	Force (kip)	Loss (KSI)	Stress (KSI)	% Loss
At Jacking	929.48	0.000	202.500	0.00
Before Prestress Transfer	920.39	1.980	200.520	0.98
After Prestress Transfer	866.38	13.746	188.754	6.79
At Lifting	866.38	13.746	188.754	6.79
At Shipping	866.38	13.746	188.754	6.79
After Deck Placement	744.38	40.326	162.174	19.91
After Superimposed Dead Loads	744.38	40.326	162.174	19.91
Final	744.38	40.326	162.174	19.91

Camber and Deflections

Stage	Original Girder Design		Fabricator Optional Design	
Estimated camber at 120 days, D	1.594 in	0.133 ft	2.097 in	0.175 ft
Estimated camber at 120 days, D	1.594 in	0.133 ft	2.097 in	0.175 ft
Deflection (Prestressing)	1.236 in	0.103 ft	1.446 in	0.121 ft
Deflection (Girder)	-0.548 in	-0.046 ft	-0.548 in	-0.046 ft
Deflection (Slab and Diaphragms)	-0.366 in	-0.030 ft	-0.366 in	-0.030 ft
Deflection (User Defined DC)	0.000 in	0.000 ft	0.000 in	0.000 ft
Deflection (User Defined DW)	0.000 in	0.000 ft	0.000 in	0.000 ft
Screed Camber, C	0.366 in	0.030 ft	0.366 in	0.030 ft
Excess Camber (based on D at 120 days)	1.228 in	0.102 ft	1.731 in	0.144 ft
Live Load Deflection (HL93 - Per Lane)	-0.455 in	-0.038 ft	-0.455 in	-0.038 ft
Optional Live Load Deflection (LRFD 3.6.1.3.2)	-0.110 in	-0.009 ft	-0.110 in	-0.009 ft



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Stress Checks

Specification = TxDOT 2010

Notes:

- Calculated total external load top and bottom stresses are multiplied by the appropriate (Top or Bottom) ratio of (Input Design Load Stress)/(Calculated Stress). This results in the Analysis Stress
- Stress Checks reflect the following sign convention: Compressive stress is negative. Tensile stress is positive.

Stress Check for Service I for Casting Yard Stage (At Release) [5.9.4.1.2]

For temporary stresses before losses in pretensioned components

Allowable tensile stress = $0.2400\sqrt{f_{ci}} = 0.480$ KSIAllowable tensile stress = $0.2400\sqrt{f_{ci}} = 0.480$ KSI if at least 1.588 in^2 of mild reinforcement is providedAllowable compressive stress = $-0.65f_{ci} = -2.600$ KSI f_{ci} required to satisfy this stress check = 3.771 KSI

Location from End of Girder (ft)	Prestress		Service I		Demand		Tension Status w/o rebar (C/D)	Tension Status w/ rebar (C/D)	Compression Status (C/D)
	f_t (KSI)	f_b (KSI)	f_t (KSI)	f_b (KSI)	f_t (KSI)	f_b (KSI)			
(0.0L _g) 0.000	0.000	0.000	0.000	0.000	0.000	0.000	Pass (∞)	Pass (∞)	Pass (∞)
(PSXFR) 0.008	0.466	-2.206	-0.000	0.000	0.466	-2.206	Pass (1.03)	Pass (1.03)	Pass (1.18)
0.750	0.467	-2.207	-0.029	0.023	0.437	-2.185	Pass (1.10)	Pass (1.10)	Pass (1.19)
(H) 4.500	0.468	-2.214	-0.168	0.129	0.300	-2.085	Pass (1.60)	Pass (1.60)	Pass (1.25)
5.792	0.469	-2.216	-0.212	0.164	0.256	-2.053	Pass (1.87)	Pass (1.87)	Pass (1.27)
(0.1L _g) 7.628	0.469	-2.219	-0.272	0.210	0.197	-2.009	Pass (2.44)	Pass (2.44)	Pass (1.29)
8.228	0.469	-2.220	-0.291	0.224	0.178	-1.996	Pass (2.69)	Pass (2.69)	Pass (1.30)
(0.2L _g) 15.255	0.471	-2.230	-0.484	0.373	-0.012	-1.857	Pass (-)	Pass (-)	Pass (1.40)
15.705	0.472	-2.230	-0.494	0.381	-0.023	-1.849	Pass	Pass	Pass



File View Help



Bridge Input Girder Input Girder View Analysis Report

General Information

Bridge	<input type="text"/>	Engineer	<input type="text" value="T Retterer"/>
Bridge ID	<input type="text"/>	Company	<input type="text" value="TxDOT"/>
Job Number	<input type="text"/>	Comments	<input type="text"/>

Design Information

Span No.	<input type="text"/>	Span Length (CL Bearings)	<input type="text"/> ft	Relative Humidity	<input type="text"/> %
Beam No.	<input type="text"/>	Beam Spacing	<input type="text"/> ft	LLDF (Moment)	<input type="text"/>
Beam Type	<input type="text" value="Tx54"/>	Slab Thickness	<input type="text"/> in	LLDF (Shear)	<input type="text"/>

Material Properties

Ec, Slab	<input type="text" value="5000.000"/> KSI	Ec, Beam	<input type="text" value="5000.000"/> KSI	f'c, Slab	<input type="text" value="4.000"/> KSI
----------	---	----------	---	-----------	--

Design Data

*ft, Design Compressive Stress, Top CL	<input type="text"/> KSI	*fb, Design Tensile Stress, Bottom CL	<input type="text"/> KSI
Mu, Required Ultimate Moment Capacity	<input type="text"/> kip-ft	* Note: Tension is negative	

Optional Uniform Design Loads

W non-comp, DC	<input type="text" value="0.000"/> kip/ft	W comp, DC	<input type="text" value="0.000"/> kip/ft	W Overlay	<input type="text" value="0.000"/> kip/ft
----------------	---	------------	---	-----------	---

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On

(Allowable compression stress factor at release = 0.65)



File View Help

Help Topics

License Agreement

About PGSuper...

Bridge Input

Report

General Information

Bridge

Engineer

T Retterer

Bridge ID

Company

TxDOT

Job Number

Comments

Design Information

Span No.

Span Length
(CL Bearings)

ft

Relative Humidity

%

Beam No.

Beam Spacing

ft

LLDF (Moment)

Beam Type

Tx54

Slab Thickness

in

LLDF (Shear)

Material Properties

Ec, Slab

5000.000

KSI

Ec, Beam

5000.000

KSI

f'c, Slab

4.000

KSI

Design Data

*ft, Design Compressive Stress, Top CL

KSI

*fb, Design Tensile Stress, Bottom CL

KSI

Mu, Required Ultimate Moment Capacity

kip-ft

* Note: Tension is negative

Optional Uniform Design Loads

W non-comp, DC

0.000

kip/ft

W comp, DC

0.000

kip/ft

W Overlay

0.000

kip/ft

Project Criteria

Select Project Criteria Library Entry that Check is to be Based On

TxDOT 2010

(Allowable compression stress factor at release = 0.65)





Hide



Back



Print



Options

Contents

Index

Search

- ? Welcome!
- ? Support
- ? License Agreement
- ? User Guide
 - ? Getting Started
 - ? Installation and Troubleshooting
 - ? User Interface
 - ? Main Menu
 - ? Bridge Input Tab
 - ? Girder Input Tab
 - ? Girder View Tab
 - ? Analysis Report Tab
- + Theoretical Manual
- + Administrator Guide

Bridge Input Tab

This tab contains bridge-level data related to the project.

Note: All data on this tab must be filled in prior to visiting other tabs.

General Information

The General Information group contains textual data used to describe the current project in TOGA reports. None of this data affects the analysis.

Bridge	Name of the Bridge
Bridge ID	TxDOT Bridge Identification Number
Job Number	CSJ
Engineer	-
Company	-
Comments	Any additional text to be included in report

Design Information

This group contains bridge-level design information

Span No	Span where the beam is located. (textual information only)
Beam No	Beam number. Generally numbered from left to right facing up-station. (textual information only)
Beam Type	Type of beam in question. <i>Note that changing beam type will reset the strand data on the Girder Input tab to Standard Strand Fill with zero strands.</i>
Span Length	Length of span as measured between bearing centerlines in feet.



Submission of Optional Girder Design

- Shop drawings
- Sealed optional design calculations (the Short Report)
- TOGA file

Questions

- PGSuper Help Desk
 - TxDOT_PGSuperHelp@txdot.gov